

TECHNICAL REPORT

---

*Bayonne Barrel and Drum  
Site - Soil Investigation  
Report*

--  
Bayonne Barrel Participating Parties  
Group/de maximis, inc.  
Newark, New Jersey

March 1997



---

8 South River Road  
Cranbury, NJ 08512-9502  
(609) 860-0590

326137



# **Executive Summary and Discussion of Findings**

## **Bayonne Barrel and Drum Site, Newark, NJ**

---

### **Factors Favor Selection of a Capping Remedy at the Bayonne Barrel and Drum Site**

In accordance with the Administrative Order on Consent, the Bayonne Barrel and Drum Participating Parties Group recently completed an extensive soil investigation program at the Bayonne Barrel and Drum site in Newark, New Jersey. The results of this investigation show that several constituents are present in soils throughout most of the site. Generally, a combination polyaromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs) and polychlorinated dioxins/furans (PCDDs/PCDFs) were found at most of the sample locations throughout the site. Volatile organic compounds (VOCs) were also detected at a few locations, primarily in the Furnace Courtyard Area of the site. The horizontal and vertical distribution of the constituents suggest that many of the constituents may be associated with the historic fill material present at the site.

Based upon the results of the investigation and the anticipated future usage of the site, it appears that a remedy involving a low-permeability cap represents the most practical remedial alternative for the site. A cap remedy could be developed which is protective of human health and the environment, technically feasible, and compatible with beneficial reuse and future development of the site. The text below presents a conceptual overview of several of the factors which support selection of a cap as a practical and protective remedy for the site.

### **Elimination of Primary Exposure Routes and Prevention of Constituent Migration**

The primary constituents associated with the site are PCDDs/PCDFs, metals, PCBs, and PAHs. Because PCDDs/PCDFs and PCBs possess low volatility and water solubility, the potential routes of exposure for these constituents are through direct contact, inhalation or ingestion of the site soil or soil particles. Installation of a low-permeability cap in conjunction with a Declaration of Environmental Restriction (DER) would effectively eliminate these potential exposure pathways by preventing direct contact with the soil and by eliminating any potential dust or erosion of soil particles. The cap remedy would also effectively preclude infiltration of rainwater through the site soil. This would further reduce potential transport of constituents from the site soil into ground water. Since PCDDs/PCDFs and PCBs are generally immobile in the environment, a cap remedy would effectively encapsulate and contain these constituents within the site.

In the short term, the risks associated with the site will be reduced by maintaining the existing institutional controls at the site. The site fence will be maintained to prevent access to the site by unauthorized personnel and prevent exposure to the site soils.

### **Limited Soil Disturbance**

Because the potential exposure pathways to the site constituents are associated with the soil or soil particles, disturbance of the soil increases the potential for exposure to or mobilization of site constituents. A cap remedy would minimize the amount of soil disturbance and potential constituent migration during the remediation activities. Most other remedial alternatives, including

excavation and off-site disposal would require extensive soil excavation and handling, increasing the potential for mobilization of and exposure to site constituents. The presence of PCDDs/PCDFs, which have been found to pose a health risk at minute concentrations, make this a particularly important consideration for this site.

#### **Technical Feasibility**

#### **Incompatibility of Site Conditions and Constituents with Treatment and Disposal Options**

The combination of constituents present at the site would make implementation of remedies other than a cap very difficult and expensive. As discussed previously, most of the constituents distributed throughout the site soils are relatively immobile in the environment. While this supports implementation of a cap remedy, the immobile and persistent nature of the constituents also makes on-site or in-situ treatment alternatives, which reduce the constituent concentrations, particularly difficult to implement. This is particularly true for PCDDs/PCDFs and PCBs since these constituents tend to adhere to soil particles. The presence of other constituents such as metals and PAHs further increases the difficulty of identifying a feasible on-site treatment technology.

Off-site treatment and disposal options would also be extremely expensive and difficult to implement due to the combination of compounds present in the soil and the volume of soil which would need to be addressed. Since the site occupies approximately 12 acres, each foot of soil would represent approximately 20,000 cubic yards of soil. Therefore, even a 5-foot cut would result in an extremely large volume of soil to be addressed and the presence of PCDDs/PCDFs and PCBs would result in very high unit disposal costs.

The shallow ground water at the site would further complicate on-site and off-site treatment and disposal alternatives. During the recent sampling activities ground water was encountered at depths as shallow as 3 feet below the land surface. Therefore, in order to excavate the impacted soil, large volumes of water would need to be managed or controlled. Ground-water control of this nature would be extremely difficult to accomplish and significantly increase the remediation costs.

#### **Historic Fill Consideration**

The origin of the site soil also favors implementation of a cap remedy. Because the area on and around the site was once a tidal wetland, most of the soil present at the site and surrounding properties consists of historic fill material. These fill materials include fill associated with a former City of Newark landfill and bottom ash from a power plant. Based upon the distribution of the site constituents, it appears that the historic fill materials, rather than site operations, are the source of many of the constituents at the site. Because the area surrounding the site also received similar fill materials, it is probable that many of the constituents detected at the site are present throughout the surrounding area.

---

**Compatibility with  
Beneficial Reuse of the  
Site**

In areas with widespread historic fill, engineering controls such as a cap are commonly employed to eliminate the need to disturb potentially widespread areas of impacted soil. This is recognized in the recently published NJDEP technical regulations (NJAC 7:26E) which establish a presumption that historic fill materials be contained on site in accordance with NJSA 58:10-12(h).

Implementation of a cap remedy would not only be compatible with the site constituents and conditions, but it would also be compatible with beneficial reuse of the site consistent with a "brown fields" type of approach. The location of the facility and the surrounding land use types, make this an ideal site to be redeveloped for industrial/commercial purposes. The site is located in a highly visible and easily accessible area of Newark. It is adjacent to several major roadways and is located close to New York and several major ports. A cap remedy could readily be developed which is compatible with commercial redevelopment of the site. A cap remedy could be designed to not only contain the site soils, but to support future reuse of the site for slab type construction.

**Conclusions**

A cap remedy would be protective of human health and the environment while optimizing the potential for future site development. The cap remedy would eliminate potential exposure routes associated with the site constituents while minimizing disturbance of the site soils. The cap remedy also eliminates the technical difficulties associated with the shallow ground water and the mixture of constituents present at the site. By providing a relatively low cost remedial alternative for the site, a cap remedy would be compatible with beneficial reuse scenarios for the site. Based upon these preliminary considerations, a cap remedy represents the most practical remedial alternative for the site.

# **Table of Contents**

---

<b>Section 1.</b>	<b>Introduction</b> .....	1-1
	1.1    Purpose and Objectives .....	1-1
	1.2    Site Description and History .....	1-1
	1.3    Summary of Regulatory History .....	1-1
	1.4    Report Organization .....	1-2
<b>Section 2.</b>	<b>Summary of Sampling Program</b> .....	2-1
	2.1    Sampling Locations .....	2-1
	2.1.1    Furnace Courtyard Area .....	2-1
	2.1.2    Storage Tank Area .....	2-3
	2.1.3    Yard Area .....	2-4
	2.1.3.1    Soil Borings .....	2-4
	2.1.3.2    Surface Soil Samples .....	2-5
	2.2    Sampling Methods .....	2-5
	2.3    Decontamination .....	2-5
	2.4    QA/QC Sampling .....	2-6
<b>Section 3.</b>	<b>Data Review</b> .....	3-1
	3.1    Furnace Courtyard Area .....	3-2
	3.1.1    Field Screening .....	3-2
	3.1.2    Analytical Results .....	3-2
	3.2    Storage Tank Area .....	3-4
	3.2.1    Field Screening .....	3-4
	3.2.2    Analytical Results .....	3-5
	3.3    Yard Area Soil Borings .....	3-7
	3.3.1    Field Screening .....	3-7
	3.3.2    Analytical Results .....	3-7
	3.4    Yard Area Surface Soil Samples .....	3-9
	3.4.1    Field Screening .....	3-9
	3.4.2    Analytical Results .....	3-10
	3.5    QA/QC Sample Results .....	3-10
	3.6    Summary .....	3-11
<b>Section 4.</b>	<b>References</b> .....	4-1
<b>Tables.</b>	1A    Analytical Results - Volatile Organic Compounds - Furnace Courtyard Area Soil Samples	
	1B    Analytical Results - Semi-Volatile Organic Compounds - Furnace Courtyard Area Soil Samples	
	1C    Analytical Results - Pesticides/PCBs - Furnace Courtyard Area Soil Samples	
	1D    Analytical Results - Metals - Furnace Courtyard Area Soil Samples	

- 1E Analytical Results - Dioxins/Dibenzofurans - Furnace Courtyard Area Soil Samples
- 2A Analytical Results - Volatile Organic Compounds - Storage Tank Area Soil Samples
- 2B Analytical Results - Semi-Volatile Organic Compounds - Storage Tank Area Soil Samples
- 2C Analytical Results - Pesticides/PCBs - Storage Tank Area Soil Samples
- 2D Analytical Results - Metals - Storage Tank Area Soil Samples
- 2E Analytical Results - Dioxins/Dibenzofurans - Storage Tank Area Soil Samples
- 3A Analytical Results - Volatile Organic Compounds - Yard Area Soil Borings
- 3B Analytical Results - Semi-Volatile Organic Compounds - Yard Area Soil Borings
- 3C Analytical Results - Pesticides/PCBs - Yard Area Soil Borings
- 3D Analytical Results - Metals - Yard Area Soil Borings
- 3E Analytical Results - Dioxins/Dibenzofurans - Yard Area Soil Borings
- 4A Analytical Results - PCBs and Lead - Yard Area Surface Soil Samples
- 4B Analytical Results - Dioxins/Dibenzofurans - Yard Area Surface Soil Samples
- 5 Analytical Results - Rinse Blanks

**Figure.**

- 1 Soil Sampling Locations

**Attachments.**

- 1 Summary of Sample Descriptions and Field Observations  
2 Analytical Data Packages (submitted under separate cover)

# **1. Introduction**

---

This Soil Investigation Report has been prepared by Blasland, Bouck & Lee, Inc. (BBL) on behalf of the Bayonne Barrel Participating Parties Group (Group) for the Bayonne Barrel and Drum site (site) located in Newark, New Jersey. This report conforms to the requirements set forth in section 300.165 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and presents a summary of the sampling activities conducted at the site, as well as the sampling results and an evaluation of the analytical data.

## **1.1 Purpose and Objectives**

As outlined in the Administrative Order on Consent (AOC) for removal action for the site dated October 1, 1996 (Index No: II CERCLA-96-0109), the purpose of the Removal Action is to abate an imminent and substantial endangerment to the public health, welfare, or the environment that may be presented by the actual or threatened release of hazardous substances, pollutants, or contaminants at or from the site. The objective of the Removal Action is to plan and conduct an investigation to identify the nature and extent of constituents in soil at the site. The purpose of the Soil Investigation Report is to transmit the results of the Removal Action conducted at the site.

## **1.2 Site Description and History**

The site is located at 150 to 154 Raymond Boulevard in Newark, Essex County, New Jersey, and occupies approximately 15 acres of Block 5002, Lots 3 and 14. The site is bounded by Raymond Boulevard and an exit ramp from Routes 1 and 9 to the north and west, respectively; an entrance ramp to the New Jersey Turnpike to the east and south; and a movie theater parking lot to the southwest.

The site operated as a metal barrel and drum refurbishing facility from the early 1940s until the early 1980s when the operating entity, Bayonne Barrel & Drum Company, filed for bankruptcy under Chapter 11. When the facility was in operation, drum cleaning operations included both open and closed-head drums. Drums were washed with a caustic solution which was drained through an oil/water separator before being discharged to a 50,000 gallon underground storage tank (UST). The liquid was decanted from the tank into the sewer system. An incinerator was then used to clean the open head drums, and the incinerator residue was collected in two pits (approximately 14 feet deep) on either side of the incinerator.

## **1.3 Summary of Regulatory History**

Based on information contained in the AOC for the site, the United States Environmental Protection Agency (USEPA) site inspections conducted in 1984, 1988, and 1991 confirmed the presence of hazardous substances as defined by the Comprehensive Environmental Recovery, Conservation, and Liability Act (CERCLA), including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and metals. In September 1991, the New Jersey Department of Environmental Protection (NJDEP) requested that USEPA evaluate the site for a CERCLA removal action. In January 1992, a Removal Site Evaluation (RSE) was completed, which concluded that CERCLA hazardous substances had been released into the environment. A Health Consultation conducted in conjunction with the RSE indicated that conditions at the site posed a potential public health threat.

In March 1993, USEPA conducted activities to remove material displaying the RCRA characteristic of ignitability that was contained in abandoned trailers. Following a fire at the site in July 1994, USEPA commenced additional site inspection/characterization and removal activities. Inspections at the site revealed ash piles, shredded tires, substances in vertical and underground storage tanks and within buildings, as well as approximately 45,000 drums. Some of the drums contained hazardous substances, and many of the drums containing these substances were open, deteriorated and/or improperly stored.

USEPA reports having performed several removal actions at the site, including:

- securing the site by repairing the perimeter fence and installing warning signs;
- removing approximately 46,000 drums;
- testing, segregating, and overpacking of hazardous substances;
- removing two ash piles containing dioxins and lead; and
- removing tanks containing sludge material.

USEPA also reports that recent sampling of site soils confirm the presence of VOCs, PCBs, and metals, as well as dioxins in soil. Based on the results of these sampling efforts, USEPA concluded that additional activities were required at the site to identify the extent of constituents in soil at the site.

#### 1.4 Report Organization

This report is organized into the following sections:

- Section 2: Summary of Sampling Program (description of areas investigated, sampling methods for each area, and QA/QC sampling);
- Section 3: Data Review (evaluation of analytical data for each area investigated, and QA/QC samples, and a preliminary exposure assessment); and
- Section 4: References.

## **2. Summary of Sampling Program**

BBL conducted a soil sampling program from January 6 through 9, 1997 to investigate three areas of the site in accordance with the AOC. These areas included:

- the Furnace Courtyard Area (FCA);
- the Storage Tank Area (STA); and
- the Yard Area (YA).

All sampling was conducted in accordance with the November 1996 Sampling and Analysis Plan (SAP) (BBL 1996), the November 1996 Quality Assurance Project Plan (QAPP) (BBL 1996a), the NJDEP Field Sampling Procedures Manual (NJDEP 1992) and the Field Analysis Manual (NJDEP 1994).

This section presents a summary of the sampling activities and any modifications to the sampling procedures presented in the SAP (BBL 1996).

### **2.1 Sampling Locations**

#### **2.1.1 Furnace Courtyard Area**

Figure 1 identifies the nine locations within the FCA where soil samples were collected. Sampling locations in the FCA were located in the field based on distances measured from existing site structures, such as buildings, fence posts, and utility poles, and documented in the field notebook. Descriptions and field observations for the soil samples collected in the FCA are included as Attachment 1.

As indicated in the SAP (BBL 1996) and on Figure 1, one surface sample (FCA-5) was located in one of the several below ground equipment pits in Building 2, and a second surface sample (FCA-1) was located at the specific location where the drum discharge conveyor entered the furnace. The seven remaining samples (FCA-2, FCA-2A, FCA-3, FCA-4, FCA-6, FCA-7, and FCA-8) were located in the courtyard surrounding the furnace. Based on the sampling plan, two samples were to be collected from each of these seven locations: one sample from the 2-foot interval immediately above the water table and one sample from the 2-foot interval representing the midpoint between the ground surface and the ground-water table. However, if the depth to ground water was shallow (less than 5 feet bgs), no midpoint sample was to be collected for analysis.

The table below indicates the sample depths and depths to ground water for each of the FCA samples:

Sample Location	Sample Depth Interval (feet bgs)	Depth to Ground Water (feet bgs)
FCA-1	0 to 2	2

Sample Location	Sample Depth Interval (feet bgs)	Depth to Ground Water (feet bgs)
FCA-2	0 to 2	2
FCA-2A	0 to 2 and 2 to 4	2
FCA-3	1 to 3	3
FCA-4	1 to 3	3
FCA-5	0 to 1.5	2
FCA-6	0 to 2	2
FCA-7	0 to 2 and 2 to 4	2
FCA-8	2 to 4	4

As indicated on the table above, the depth to ground-water measurements for each of the seven sampling locations ranged from 2 to 4 feet bgs. Because ground water was shallow (less than 5 feet bgs), soil samples were only collected from the 2-foot interval immediately above the water table, in accordance with the SAP (BBL 1996), with the exception of sample locations FCA-2A and FCA-7. Two samples were collected from locations FCA-2A and FCA-7 because a colored sludge-like material was encountered at the 2- to 4-foot depth interval at these locations; while black and dark brown silt, sand, and gravel was encountered at this depth at the other five sample locations. Additionally, although ground water was encountered at 2 feet bgs at FCA-7, the bottom of the tank or pit was not encountered until 4 feet bgs.

A USEPA representative was on site for the soil sampling at the FCA on January 6, 1997, and indicated that:

- sampling location FCA-8 should be added to the FCA sampling;
- collecting only one soil sample at locations FCA-1, FCA-2, FCA-3, FCA-4, FCA-5, FCA-6, and FCA-8 was appropriate given the shallow depth to ground water; and
- one additional sample should be collected from below the ground water table at locations FCA-2A and FCA-7.

As indicated above, these modifications were incorporated into the FCA sampling program.

All FCA soil samples were analyzed for Target Compound List (TCL) VOCs, semivolatile organic compounds (SVOCs), PCBs, and Organochlorine Pesticides, Target Analyte List (TAL) metals, and polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans (PCDDs/PCDFs). In accordance with the SAP (BBL 1996), the samples collected for VOC analysis were collected from the 0.5- to 2.0-foot depth interval. Samples collected from this interval were

labeled as a 0- to 2-foot depth interval (e.g., FCA-1 (0-2)) on the Chain-of-Custody so that sample identifications would be consistent with the other analyses.

### 2.1.2 Storage Tank Area

Figure 1 identifies the three locations within the STA where soil samples were collected. Sampling locations in the STA were located in the field based on distances measured from existing site structures, such as buildings, fence posts, and utility poles, and documented in the field notebook. Descriptions and field observations for the soil samples collected in the STA are included in Attachment 1.

Based on the SAP (BBL 1996), soil samples were to be collected from three depth intervals:

- one sample from the 0- to 2-foot interval representing surface soils;
- one sample from the 2-foot interval immediately above the water table; and
- one sample from the 2-foot interval representing the midpoint between the ground surface and the ground-water table.

However, if the depth to ground water was shallow (less than 5 feet bgs), no midpoint sample was to be collected for analysis.

The table below indicates the sample depths and depths to ground water for each of the STA samples:

Sample Location	Sample Depth Interval (feet bgs)	Depth to Ground Water (feet bgs)
STA-1	0 to 2	2
STA-2	0 to 2	2
STA-3	1 to 3	3

As indicated in the above table, the depth to ground-water measurements for the three sampling locations ranged from 2 to 3 feet bgs. Because ground water was shallow (less than 5 feet), soil samples were only collected from the 2-foot interval immediately above the water table, in accordance with the SAP (BBL 1996). Based on the sampling depths listed above, these soil samples are also indicative of surface soil quality in the STA. All STA soil samples were analyzed for TCL VOCs, SVOCs, PCBs, and Organochlorine Pesticides, TAL metals, and PCDDs/PCDFs. In accordance with the SAP (BBL 1996), the samples collected for VOC analysis were collected from the 0.5- to 2.0-foot depth interval. Samples collected from this interval were labeled as a 0- to 2-foot depth interval (e.g., STA-1 (0-2)) on the Chain-of-Custody so that sample identifications would be consistent with the other analyses.

The SAP (BBL 1996) also indicated that an additional surface soil sample (0- to 2-foot depth interval) would be collected from the collection sump of the concrete trough, identified by the Bayonne Barrel and Drum Company as the oil/water separator. Lexon tubing was used to probe the entire length of the STA trench, and no sludge or sediment was identified. The only material found was a roofing material from the adjacent building. Therefore, a surface soil sample was not collected at this location.

### 2.1.3 Yard Area

Figure 1 identifies the 58 locations within the YA where soil samples were collected. Soil borings were installed at five locations (YA-1 through YA-5) to collect soil samples from three discrete depth intervals, and surface soil samples (0- to 2-foot depth interval) were collected from the remaining 53 locations (YA-6 through YA-58). The following sections discuss the YA soil borings and surface soil samples separately. Descriptions and field observations for the soil samples collected in the YA are included in Attachment 1.

#### 2.1.3.1 Soil Borings

Soil borings were installed at five locations (YA-1 through YA-5), which were identified based on a grid established in the field. Based on the SAP (BBL 1996), soil samples were to be collected from these five borings from three depth intervals:

- one sample from the 0- to 2-foot interval representing surface soils;
- one sample from the 2-foot interval immediately above the water table; and
- one sample from the 2-foot interval representing the midpoint between the ground surface and the ground-water table.

The table below indicates the sample depths and depths to ground water for each of the YA borings:

Sample Location	Sample Depth Interval (feet bgs)			Depth to Ground Water (feet bgs)
	Surface	Midpoint	Water Table	
YA-1	0 to 2	7 to 9	14 to 16	16
YA-2	0 to 2	4 to 6	8 to 10	10
YA-3	0 to 2	2 to 4	4 to 6	6
YA-4	0 to 2	3 to 5	6 to 8	8
YA-5	0 to 2	3 to 5	6 to 8	8

As indicated in the above table, the depth to ground-water measurements for the five sampling locations ranged from 6 to 16 feet bgs.

All soil samples from the YA borings were analyzed for TCL VOCs, SVOCs, PCBs and Organochlorine Pesticides, TAL metals, and PCDDs/PCDFs. In

accordance with the SAP (BBL 1996), the samples collected for VOC analysis were collected from the 0.5- to 2.0-foot depth interval. Samples collected from this interval were labeled as a 0- to 2-foot depth interval (e.g., YA-1 (0-2)) on the Chain-of-Custody so that sample identifications would be consistent with the other analyses.

#### **2.1.3.2 Surface Soil Samples**

Surface soil samples (0- to 2-foot depth interval) were collected from 53 sampling locations (YA-6 through YA-58), which were spatially distributed within the 11.5 acre Yard Area, and located based on a grid established in the field.

Surface soil samples collected from these locations were analyzed for PCBs, lead, and PCDDs/PCDFs.

#### **2.2 Sampling Methods**

Surface soil samples in the FCA, STA, and YA were collected using a decontaminated, stainless steel, hand auger. Any surface vegetation was removed prior to collecting the soil samples. At each location, the hand auger was advanced with a straight, vertical entry into the soil so as to secure a reasonably representative sample. The sampler containing the soil sample was placed on an aluminum or stainless steel tray, and the excess soil was removed from the outside of the sampler with a precleaned spatula to avoid cross contamination over the sample depth. The sample was then extruded onto a stainless steel tray. Sample increments were mixed thoroughly prior to filling the appropriate sample jars, with the exception of the VOC analysis jars, which were filled prior to homogenization.

Subsurface soil samples in the YA were collected using a Geoprobe sampling technique. Borings were installed by driving 1-inch diameter stainless steel rods into the ground using a truck-mounted percussion hammer and hydraulic jack. Soil samples were collected at discrete intervals and analyzed for the constituents listed in Section 2.1.3. Prior to submission to the laboratory, subsurface soil samples were screened with a photoionization detector (PID). Prior to use each day, the PID was calibrated using isobutylene in accordance with standard calibration procedures.

#### **2.3 Decontamination**

As indicated in the SAP (BBL 1996), cleaning of the reusable field sampling equipment (e.g., scoops, mixing bowls, spatulas) followed the decontamination procedures listed below:

- wash with non-phosphate detergent and distilled water;
- rinse with tap water;
- rinse with distilled water;
- allow to air dry; and
- wrap in aluminum foil.

Sampling equipment was decontaminated prior to use at each sampling location, and decontamination rinsate was collected in plastic containers that were transported to each sampling location.

Large sampling equipment such as drill rigs, auger flights, drill rods, and drill bits, were decontaminated by washing with a high pressure wash. Particulate matter was removed with a brush as needed. Large sampling devices were cleaned prior to mobilizing to the site, after mobilizing to the site, between each sampling location, and prior to leaving the site.

#### 2.4 QA/QC Sampling

Quality Assurance/Quality Control (QA/QC) sampling included collection and analysis of two equipment rinse blanks, five blind duplicate samples (one per 20 samples), and five matrix spike (MS) and five matrix spike duplicate (MSD) samples (one MS/MSD set per 20 samples).

The two equipment rinse blanks were collected during the surface soil sampling in the YA on January 8 and 9, 1997, and were analyzed for lead, PCBs, and PCDD/PCDFs based on the soil sample analyses. Rinse blanks were not collected for the Geoprobe sampling conducted at the FCA, STA, and YA boring locations on January 6 and 7, 1997 because dedicated sampling equipment was used to collect each sample.

The five blind duplicate samples were collected from the following locations and analyzed for the indicated parameters:

Sample ID	Sample Location	Sample Depth	Parameters
BBD-D1	YA-1	7 to 9 feet	VOCs, SVOCs, Pesticides, PCBs, Metals, PCDD/PCDF
BBD-D2	YA-3	0 to 2 feet	VOCs, SVOCs, Pesticides, PCBs, Metals, PCDD/PCDF
BBD-D3	YA-13	0 to 2 feet	PCBs, Lead, PCDD/PCDF
BBD-D4	YA-56	0 to 2 feet	PCBs, Lead, PCDD/PCDF
BBD-D5	YA-57	0 to 2 feet	PCBs, Lead, PCDD/PCDF

Additional sample volume for the MS and MSD samples was collected from the following locations:

- YA-2 (4 to 6 feet);
- YA-4 (3 to 5 feet);
- YA-29 (0 to 2 feet);
- YA-52 (0 to 2 feet); and
- YA-58 (0 to 2 feet).

### 3. Data Review

Tables 1 through 4 summarize the analytical data for the FCA, STA, YA soil borings, and YA surface soil samples, respectively. This section presents a review of the analytical data, which was conducted to identify detections of constituents in the three areas. Detections of VOCs, SVOCs, Pesticides, and PCBs were evaluated based on concentration range and frequency of detection. Metals were identified based on comparison of detected concentrations to typical background concentrations for metals in urban soils in New Jersey (Fields et al 1987). These typical background concentrations are as follows:

Metal	Typical Background Range (mg/kg)	Metal	Typical Background Range (mg/kg)
Aluminum	Not Available	Lead	25.8 - 617
Antimony	<0.02 - 0.69	Manganese	30 - 952
Arsenic	0.34 - 48.9	Mercury	<0.01 - 2.71
Barium	Not Available	Nickel	5.5 - 53.8
Beryllium	0.16 - 35.9	Selenium	<0.01 - 0.15
Cadmium	0.16 - 2.36	Silver	0.04 - 1.53
Chromium	4.9 - 24.6	Thallium	<0.06 - 0.46
Cobalt	Not Available	Vanadium	1.0 - 46.1
Copper	8.84 - 143	Zinc	40.4 - 317

Concentrations of calcium, iron, magnesium, potassium, and sodium were excluded from the evaluation because these are non-toxic, essential elements.

Detected concentrations of dioxins/dibenzofurans were evaluated based on total TCDD equivalents, per the 1989 *Update to the Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs)* (USEPA 1989). According to this method, a set of derived Toxicity Equivalency Factors (TEFs) is used to convert the concentration of any CDD/CDF congener into an equivalent concentration of 2,3,7,8-TCDD. The Total TCDD equivalents for a sample was calculated as the sum of each detected concentration multiplied by its TEF as follows:

$$\text{Total TCDD Equivalent} = \sum [(\text{congener 1 concentration} \times \text{TEF 1}) + (\text{congener 2 concentration} \times \text{TEF 2}) + \dots + (\text{congener "n" concentration} \times \text{TEF "n"})]$$

TEFs for the CDD/CDF congeners detected at the site are as follows:

CDD/CDF Congener	TEF
2,3,7,8-TCDD	1.0

CDD/CDF Congener	TEF
1,2,3,7,8-PeCDD	0.5
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
1,2,3,4,6,7,8,9-OCDD	0.001
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	- 0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
1,2,3,4,6,7,8,9-OCDF	0.001

### 3.1 Furnace Courtyard Area

#### 3.1.1 Field Screening

This section presents the results of the field screening and the laboratory analysis for the FCA soil samples.

As indicated in Section 2.2, soil samples from the FCA were screened using a PID prior to submission to the laboratory. PID readings for these soil samples are as follows:

Depth Interval	PID Reading (ppm)									
	FCA-1	FCA-2	FCA-2A	FCA-3	FCA-4	FCA-5	FCA-6	FCA-7	FCA-8	
0 to 2	100	250	200	30	20	260	20	300	80	
2 to 4	-	50	220	150	80	-	5	200	120	
4 to 6	-	20	-	-	5	-	-	-	-	4

"-" No PID reading; ground water encountered

As shown in this table, the highest PID readings were identified in the top 4 feet of soil with minimal readings in the 4- to 6-foot depth interval.

#### 3.1.2 Analytical Results

Analytical results for VOCs, SVOCs, Pesticides/PCBs, metals, and dioxins/

dibenzofurans in the FCA soil samples are presented in Tables 1A, 1B, 1C, 1D, and 1E, respectively. Highlights of these results are as follows:

- Ethylbenzene, toluene, and xylenes were the most frequently detected VOCs:
  - ethylbenzene (3 ug/kg to 1,300,000 ug/kg);
  - toluene (3 ug/kg to 11,000,000 ug/kg); and
  - xylenes (not detected to 5,400,000 ug/kg).
- Detected concentrations of these three VOCs were relatively higher than other VOCs. Other VOCs detected less frequently included 4-methyl-2-pentanone, methylene chloride, styrene, tetrachloroethene, 1,1,1-trichloroethane, and trichloroethene.
- As indicated in Table 1B, the SVOCs most frequently detected at the relatively highest concentrations were:
  - Phthalates
    - di-n-butyl phthalate (1,400 ug/kg to 580,000 ug/kg);
    - di-n-octyl phthalate (not detected to 55,000 ug/kg)
    - butylbenzyl phthalate (2,000 ug/kg to 330,000 ug/kg); and
    - bis(2-ethylhexyl)phthalate (12,000 ug/kg to 1,500,000 ug/kg).
  - Phenols
    - phenol (330 ug/kg to 190,000 ug/kg);
    - 2-methylphenol (not detected to 37,000 ug/kg); and
    - 4-methylphenol (not detected to 840,000 ug/kg).
  - PAHs (up to 84,000 ug/kg).
- As indicated in Table 1C, the organochlorine pesticides detected at the highest concentrations were:
  - 4,4'-DDE (not detected to 6,400 ug/kg);
  - 4,4'-DDD (not detected to 1,400 ug/kg);
  - alpha-Chlordane (not detected to 1,200 ug/kg); and
  - gamma-Chlordane (not detected to 1,300 ug/kg).
- Three PCB mixtures were detected (Aroclors 1248, 1254, and 1260), and concentrations ranged as follows:
  - Aroclor-1248 (not detected to 140,000 ug/kg);

- Aroclor-1254 (not detected to 430,000 ug/kg); and
- Aroclor 1260 (not detected to 16,000 ug/kg).
- Detected concentrations of metals were compared to typical background concentrations for metals in urban soils in New Jersey (Fields et al 1987). Metals detected in multiple samples at elevated concentrations relative to these background concentrations included the following:

Metal	Range of Typical Background Concentrations (mg/kg)	Range of Detected Concentrations (mg/kg)
Antimony	<0.02 - 0.69	26.7 - 231
Cadmium	0.16 - 2.36	not detected - 143
Chromium	4.9 - 24.6	201 - 31,100
Copper	8.84 - 143	349 - 1,970
Lead	25.8 - 617	1,390 - 172,000
Manganese	30 - 952	269 - 4,470
Mercury	<0.01 - 2.71	0.349 - 43.9
Nickel	5.5 - 53.8	45.6 - 1,050
Selenium	<0.01 - 0.15	not detected - .56.3
Silver	0.04 - 1.53	not detected - 56.7
Zinc	40.4 - 317	646 - 5,740

Additionally, two detections of arsenic (52.9 mg/kg and 50.3 mg/kg) were also elevated relative to the range of typical background concentrations (0.34 mg/kg to 48.9 mg/kg)

- Detected PCDD/PCDF congeners consisted predominantly of hepta- and octa- chlorinated dibenzodioxins and furans. Based on the total TCDD equivalents calculated per USEPA (1989), the total TCDD equivalents ranged from 0.0014 ug/kg to 1.76 mg/kg, as shown in Table 1E.

### 3.2 Storage Tank Area

#### 3.2.1 Field Screening

This section presents the results of the field screening and the laboratory analysis for the STA soil samples.

As indicated in Section 2.2, soil samples from the STA were screened using a PID prior to submission to the laboratory. PID readings for these soil samples are as follows:

Depth Interval	PID Reading (ppm)		
	STA-1	STA-2	STA-3

Depth Interval	PID Reading (ppm)		
0 to 2	25	120	70
2 to 4	6	10	100
4 to 6	-	15	-

"-" No PID reading collected; ground water encountered

As indicated in the above table, the highest PID readings were identified in the top 4 feet of soil with minimal readings in the 4- to 6-foot depth interval. These readings are of similar magnitude to those detected in the FCA soil samples.

### 3.2.2 Analytical Results

Analytical results for VOCs, SVOCs, Pesticides/PCBs, metals, and dioxins/dibenzofurans in the STA soil samples are presented in Tables 2A, 2B, 2C, 2D, and 2E, respectively. Highlights of these results are as follows:

- The highest detected concentrations of VOCs were detected in sample STA-3, and included the following:
  - benzene (2,400 ug/kg);
  - chlorobenzene (2,800 ug/kg);
  - ethylbenzene (5,700 ug/kg);
  - toluene (3,900 ug/kg); and
  - xylenes (19,000 ug/kg).

VOCs were detected at substantially lower concentrations in samples STA-1 and STA-2, as indicated in Table 2A.

- As indicated in Table 2B, the SVOCs detected most frequently and at the highest relative concentrations were:
  - Phthalates
    - di-n-butyl phthalate (310 ug/kg to 570,000 ug/kg); and
    - bis(2-ethylhexyl)phthalate (14,000 ug/kg to 37,000 ug/kg).
  - PAHs
    - benzo(a)pyrene (780 ug/kg to 1,300 ug/kg);
    - benzo(b)fluoranthene (1,200 ug/kg to 1,600 ug/kg);
    - chrysene (810 ug/kg to 2,000 ug/kg);
    - fluoranthene (1,400 ug/kg to 3,800 ug/kg);
    - naphthalene (1,300 ug/kg to 4,100 ug/kg);
    - phenanthrene (2,400 ug/kg to 4,400 ug/kg); and
    - pyrene (1,200 ug/kg to 3,600 ug/kg).

- As indicated in Table 2C, the organochlorine pesticides detected at the highest concentrations were:
  - Aldrin (not detected to 1,400 ug/kg);
  - 4,4'-DDE (350 ug/kg to 1,400 ug/kg);
  - 4,4'-DDD (480 ug/kg to 860 ug/kg); and
  - alpha-Chlordane (320 ug/kg to 730 ug/kg).
- Two PCB mixtures were detected (Aroclors 1248 and 1260), and concentrations ranged as follows:
  - Aroclor-1248 (13,000 ug/kg to 14,000 ug/kg); and
  - Aroclor 1260 (5,300 ug/kg to 6,800 ug/kg).
- Detected concentrations of metals were compared to typical background concentrations for metals in urban soils in New Jersey (Fields 1987). Metals detected in multiple samples at elevated concentrations relative to these background concentrations included the following:

Metal	Typical Background Concentration Range (mg/kg)	Range of Detected Concentrations (mg/kg)
Antimony	<0.02 - 0.69	3.93 - 29.6
Cadmium	0.16 - 2.36	6.16 - 406
Chromium	4.9 - 24.6	72.3 - 1,490
Copper	8.84 - 143	138 - 564
Lead	25.8 - 617	545 - 21,300
Nickel	5.5 - 53.8	48.2 - 61.3
Selenium	<0.01 - 0.15	1.37 - 35.4
Thallium	<0.06 - 0.46	1.11 - 4.02
Zinc	40.4 - 317	437 - 11,200

Additionally, one detection of silver (2.39 mg/kg) was elevated relative to the background concentration range (0.04 mg/kg to 1.53 mg/kg).

- Detections of PCDD/PCDF congeners consisted of hepta- and octa-CDDs and tetra-, penta-, hexa-, hepta- and octa-CDFs. Based on the TCDD equivalents calculated per USEPA (1989), the total TCDD equivalents ranged from 1.09 ug/kg to 2.85 mg/kg, as shown in Table 2E.

### **3.3 Yard Area Soil Borings**

#### **3.3.1 Field Screening**

This section presents the results of the field screening and the laboratory analysis for the YA soil boring samples.

As indicated in Section 2.2, soil samples from the YA borings were screened using a PID prior to submission to the laboratory. PID readings for these soil samples are as follows:

Depth Interval	PID Reading (ppm)				
	YA-1	YA-2	YA-3	YA-4	YA-5
0 to 2	1.2	1.6	10.2	0.1	3.6
2 to 4	3.6	0.2	6.8	0.8	2.4
4 to 6	4.0	0.2	2.8	18	1.8
6 to 8	2.8	0.4	1.8	16	0.8
8 to 10	3.0	0.6	-	10	-
10 to 12	3.2	1.0	-	-	-
12 to 14	0.6	-	-	-	-
14 to 16	1.2	-	-	-	-
16 to 18	0.8	-	-	-	-

"." No PID reading collected; ground water encountered.

As indicated in the above table, the highest PID readings were identified in the 4- to 10-foot depth interval, with minimal readings in the 0-to 4- foot and 10- to 18-foot depth intervals. It is worthy of note that these readings are approximately one order of magnitude lower than the PID readings for the FCA and STA soil samples.

#### **3.3.2 Analytical Results**

Analytical results for VOCs, SVOCs, Pesticides/PCBs, metals, and dioxins/dibenzofurans in the YA soil boring samples are presented in Tables 3A, 3B, 3C, 3D, and 3E, respectively. Highlights of these results are as follows:

- VOC concentrations in the YA soils were substantially less than those reported in samples from the FCA and the STA. The highest most frequently detected VOCs were:
  - acetone (not detected to 230 ug/kg); and
  - toluene (not detected to 19 ug/kg).

Other VOCs were detected less frequently and at lesser concentrations, as indicated in Table 3A.

- As indicated in Table 3B, the SVOCs detected most frequently and at the relatively highest concentrations were primarily PAHs (concentrations up to 51,000 ug/kg), with fewer elevated detections of bis(2-ethylhexyl)phthalate (37 ug/kg to 14,000 ug/kg) and di-n-butyl phthalate (not detected to 3,900 ug/kg).
- As indicated in Table 3C, the highest detected concentrations of organochlorine pesticides were detected in samples YA-3 (0-2) and YA-3 (2-4), and include the following:
  - 4,4'-DDE (380 ug/kg and 460 ug/kg);
  - Endosulfan II (1,100 ug/kg and 1,200 ug/kg); and
  - 4,4'-DDD (840 ug/kg and 830 ug/kg).
- Two PCB mixtures were detected (Aroclors 1248 and 1260), and concentrations ranged as follows:
  - Aroclor-1248 (not detected to 220,000 ug/kg); and
  - Aroclor 1260 (not detected to 11,000 ug/kg).
- Detected concentrations of metals were compared to typical background concentrations for metals in urban soils in New Jersey (Fields et al 1987). Metals detected in multiple samples at elevated concentrations relative to these background concentrations included the following:

Metal	Typical Background Concentration (mg/kg)	Range of Detected Concentrations (mg/kg)
Antimony	<0.02 - 0.69	not detected - 70.9
Arsenic	0.34 - 48.9	2.46 - 121
Cadmium	0.16 - 2.36	not detected - 85.5
Chromium	4.9 - 24.6	14.5 - 455
Copper	8.84 - 143	11.3 - 1,870
Lead	25.8 - 617	78.1 - 4,780
Mercury	<0.01 - 2.71	not detected - 7.11
Nickel	5.5 - 53.8	8.29 - 950
Selenium	<0.01 - 0.15	not detected - 43.4
Silver	0.04 - 1.53	not detected - 8.87
Thallium	<0.06 - 0.46	not detected - 2.12

Metal	Typical Background Concentration (mg/kg)	Range of Detected Concentrations (mg/kg)
Zinc	40.4 - 317	97.4 - 11,700

- Detections of PCDD/PCDF congeners consisted of hepta- and octa-CDDs and tetra-, penta-, hexa-, hepta-, and octa-CDFs. Based on the total TCDD equivalents calculated per USEPA(1989), the total TCDD equivalents ranged from 0 ug/kg (no dioxins or dibenzofurans detected) to 212.29 mg/kg, as shown in Table 3E.

### 3.4 Yard Area Surface Soil Samples

#### 3.4.1 Field Screening

This section presents the results of the field screening and the laboratory analysis for the YA surface soil samples.

As indicated in Section 2.2, the YA surface soil samples were screened using a PID prior to submission to the laboratory. PID readings for these soil samples are as follows:

ID	PID (ppm)	ID	PID (ppm)	ID	PID (ppm)
YA-6	0.2	YA-24	0.6	YA-42	7.0
YA-7	130	YA-25	1.0	YA-43	65
YA-8	2.4	YA-26	0.0	YA-44	0.0
YA-9	0.1	YA-27	28	YA-45	0.1
YA-10	4.0	YA-28	0.4	YA-46	1.6
YA-11	0.0	YA-29	20.0	YA-47	0.1
YA-12	0.2	YA-30	4.0	YA-48	15.4
YA-13	2.0	YA-31	0.6	YA-49	3.0
YA-14	1.6	YA-32	0.0	YA-50	84
YA-15	0.2	YA-33	0.5	YA-51	12.4
YA-16	2.0	YA-34	0.0	YA-52	0.0
YA-17	0.1	YA-35	1.0	YA-53	210
YA-18	0.1	YA-36	0.6	YA-54	300
YA-19	0.0	YA-37	2.8	YA-55	22.0
YA-20	0.0	YA-38	8.6	YA-56	0.2
YA-21	0.8	YA-39	14.8	YA-57	0.1
YA-22	0.4	YA-40	22	YA-58	26.0
YA-23	1.2	YA-41	54.0		

As indicated in the above table, the PID readings for the YA surface soil

samples ranged from 0.0 ppm to 300 ppm. These values are similar to those detected for samples collected from the YA soil borings with the exception of readings from samples YA-7 (130 ppm), YA-53 (210 ppm), and YA-54 (300 ppm).

### 3.4.2 Analytical Results

Analytical results for PCBs/Lead, and dioxins/dibenzofurans in the YA surface soil samples are presented in Tables 4A and 4B, respectively. Highlights of these results are as follows:

- As indicated in Table 4A, two PCB mixtures were detected (Aroclors 1248 and 1260), and concentrations ranged as follows:
  - Aroclor-1248 (not detected to 3,400,000 ug/kg); and
  - Aroclor 1260 (390 mg/kg to 120,000 ug/kg).
- As indicated in Table 4A, detected concentrations of lead ranged from 116 mg/kg to 198,000 mg/kg. Forty-four of the 53 detections (83 percent) were greater than the maximum typical background concentration of lead in urban soils in New Jersey (617 mg/kg).
- All congeners of PCDD/PCDF analyzed were detected. Based on the total TCDD equivalents calculated per USEPA(1989), the total TCDD equivalents ranged from 0.02 ug/kg to 911.01 ug/kg, as shown in Table 4B.

### 3.5 QA/QC Sample Results

QA/QC samples were evaluated based on the analytical results for the equipment rinse blanks and the laboratory method blanks, and the conformance/nonconformance summaries provided in the data packages.

Constituents were not detected in equipment rinse blanks as indicated in Table 5. Constituents detected in the laboratory method blanks include the following:

- Three PAHs [phenanthrene (3,200 ug/kg), fluoranthene (2,600 ug/kg), and pyrene (2,500 ug/kg)] detected in the laboratory method blank (SBLK8877) associated with sample FCA-5. The concentrations detected in the laboratory method blank were one to two orders of magnitude less than the concentrations detected in sample FCA-5 (150,000 ug/kg, 61,000 ug/kg, and 38,000 ug/kg, respectively). Based on these concentrations, the laboratory concluded that the concentrations in the blank were not contributing to the concentrations in the sample, and the sample was not reanalyzed.
- Four phenols [2,4-dimethylphenol (34J ug/kg), 4-chloro-3-methylphenol (42J ug/kg), 2,4,6-trichlorophenol (36J ug/kg), and 4-nitrophenol (33J ug/kg)] were detected in one (SBLK8816) of the four laboratory method blanks associated with the STA and YA soil boring samples. None of the four phenols were detected in the STA and YA soil boring samples.

The laboratory conformance summaries in the data packages indicate the following with regard to the usability of the analytical data:

#### VOCs

- One surrogate recovery and one internal standard area were outside of QC limits for sample STA-1 (0-2) due to matrix interference. The laboratory indicated that this interference may cause the reported VOC concentrations for this sample to be higher or lower than the concentrations actually in the sample. It is worthy of note that VOCs detected in sample STA-1 (0-2) were limited to low-level concentrations of acetone (15 ug/kg) and toluene (7 ug/kg).
- The recoveries for benzene and chlorobenzene exceeded the Relative Percent Difference (RPD) limits in the medium level batch MS/MSD samples associated with the STA and YA soil boring samples. The laboratory indicated that the precision of the benzene and chlorobenzene concentrations reported for these samples may be questionable. It is worthy of note that benzene and chlorobenzene were only detected in the following STA and YA soil boring samples:

Sample ID	Benzene Concentration (ug/kg)	Chlorobenzene Concentration (ug/kg)
STA-2 (0-2)	270J	430
STA-3 (1-3)	2,400	2,800
YA-3 (0-2)	3J*	ND
YA-3 (2-4)	12	ND
YA-3 (4-6)	22	ND

"J" - estimated concentration below the detection limit.

\* Average of samples YA-3 (0-2) and blind duplicate sample BBD-D2.

ND - Not Detected

#### SVOCs

- Sample YA-5 (3-5) contained a detection of benzo(b)fluoranthene (7,200 ug/kg) that exceeded the instrument calibration range ("E" qualified). In this situation, the laboratory would usually reanalyze the sample at a higher dilution factor. However, the laboratory did not reanalyze sample YA-5 (3-5) because the detected concentration was close to the upper end of the calibration range, and reanalysis at a higher dilution would not provide more accurate results. Therefore, the actual concentration of benzo(b)fluoranthene in sample YA-5 (3-5) may be higher or lower than the reported detection of 7,200 ug/kg.

Based on the data review, the following comments have been developed regarding constituents and soil quality.

- VOCs were detected in samples from all three areas. The largest number and highest concentrations of VOCs were detected in the FCA soil samples,

and may be related to the operations conducted in this area. VOC concentrations in the YA soil boring samples were substantially less than those in the FCA and STA surface soil samples;

- PAHs and phthalates were the SVOCs most frequently detected in all three areas. Concentrations of PAHs detected in the soil samples were comparable for the three areas, and concentrations of phthalates were slightly lower in the YA soil boring samples than the surface soil samples from the FCA and the STA;
- A number of metals were detected at concentrations above typical background concentrations for urban soils in New Jersey. The ranges of detected concentrations were similar for the three areas, spanning several orders of magnitude within each area. The ranges of detected concentrations were also similar between the surface soil from the FCA and STA, and the subsurface soil from the YA soil borings;
- Three PCB mixtures (Aroclor-1248, 1254, and 1260) were detected in the soil samples. Aroclor-1254 was only detected in the FCA soil samples, and Aroclors-1248 and 1260 were detected in soil samples from all three areas. Concentrations of Aroclor-1248 were lowest in the STA surface soil samples, and highest in the YA soil boring samples. Concentrations of Aroclor-1260 were comparable among the three areas.
- PCDD/PCDF congeners detected in the FCA and STA were primarily hepta and octa CDD and all the CDFs. The YA soil samples contained detections of all the CDD/CDF congeners for which the samples were analyzed. The YA surface soil and soil boring samples contained the highest total TCDD equivalents, which were greater than the total TCDD equivalents in the FCA and STA surface soil samples by two orders of magnitude.
- Metals, phthalates, and several products of incomplete combustion (e.g., PAHs, dioxins, and furans) were distributed throughout the soil both vertically and horizontally. Based on the distribution of constituents at the site, it appears that historic fill materials, rather than the site operations, may be the source of many of the constituents detected at the site. Since the area was once a tidal wetland, the site soils consist primarily of historical fill material in the form of bottom ash, which was used to develop the site and the surrounding areas. Additionally, a portion of the Newark landfill exists within the property boundaries.

## **4. References**

---

- BBL. 1996. *Sampling and Analysis Plan*. Prepared for the Bayonne Barrel and Drum site, Newark, New Jersey.
- BBL 1996a. *Quality Assurance Project Plan*. Prepared for the Bayonne Barrel and Drum site, Newark, New Jersey.
- Fields, T.W, T.F. McNevin, R.A. Harkov, and J.V. Hunter. 1987. *A Summary of Selected Soil Constituents and Contaminants at Background Locations in New Jersey*. NJDEP Site Remediation Program and the Department of Environmental Sciences, Rutgers University.
- NJDEP. 1992. *Field Sampling Procedures Manual*.
- NJDEP. 1994. *Field Analysis Manual*.
- USEPA. 1989. *Update to the Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs)*. Risk Assessment Forum.

**TABLES**

## **FIGURES**

Data and Sample Qualifiers for Tables 1 through 5  
Bayonne Barrel and Drum Site  
Newark, New Jersey

---

**QUALIFIER DEFINITION**

***DATA QUALIFIERS - ORGANICS ANALYSES***

- U      Indicates that the compound was analyzed for but not detected.  
(NOTE: Value indicates detection limit for compound)
- J      This qualifier indicates an estimated concentration.
- B      This qualifier is used when the analyte is found in a method blank as well as the sample.
- E      Exceeds calibration range.
- D      This qualifier indicates all compounds identified in an analysis at a secondary dilution.

***DATA QUALIFIERS - INORGANICS ANALYSES***

- U      Result is below the Method Detection Limit (MDL).  
(NOTE: Value indicates detection limit for compound)
- B      Result is between the MDL and the Reporting Limit (RL).

***SAMPLE QUALIFIERS***

- DL     Indicates that the analysis was performed at a secondary dilution.
  - RE     Rerun - Indicates that the analysis is a reinjection or a reextraction and reanalysis, usually due to a failed QC element in the initial analysis.
-

**TABLE 1**  
**FURNACE COURTYARD AREA SOIL SAMPLES**

**Table 1A**  
**Analytical Results - Volatile Organic Compounds**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	FCA-1 0-2 70094003 01/06/97 Soil (0.5-2)	FCA-2 70092001 01/06/97 Soil (0.5-2)	FCA2A 0-2 70094005 01/06/97 Soil (0.5-2)	FCA2A 0-2DL 70094005DL 01/06/97 Soil (2-4)	FCA2A 2-4 70094006 01/06/97 Soil (2-4)	FCA-3 70092002 01/06/97 Soil (1-3)
PARAMETERS	UNITS					
VOLATILES						
Chlorobenzene	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
Ethylbenzene	UG/KG	27000	130000	1300000	1200000 D	900000
4-Methyl-2-Pentanone	UG/KG	8400 U	63000 U	800000	760000 JD	520000
Methylene chloride	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
Styrene	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
1,1,2,2-Tetrachloroethane	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
Tetrachloroethylene	UG/KG	2900 J	33000 U	260000 U	530000 U	180000 U
Toluene	UG/KG	160000	620000	14000000 E	11000000 D	7600000
1,1,1-Trichloroethane	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
Trichloroethylene	UG/KG	4400 U	33000 U	260000 U	530000 U	180000 U
Xylenes (Total)	UG/KG	110000	420000	5400000	4900000 D	3800000
						67000

Table 1A (cont.)  
 Analytical Results - Volatile Organic Compounds  
 Furnace Courtyard Area Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID	FCA-4	FCA5(0-1.5)	FCA-6	FCA7 0-2	FCA7 2-4	FCA-8 2-4
Laboratory Sample Number	70092003	70141015	70092004	70094001	70094002	70094004
Sampling Date	01/06/97	01/09/97	01/06/97	01/06/97	01/06/97	01/06/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(1-3)	(0-1.5)	(0.5-2)	(0.5-2)	(2-4)	(2-4)
PARAMETERS	UNITS					
VOLATILES						
Chlorobenzene	UG/KG	620 J	190000 U	6 U	15000 U	190000 U
Ethylbenzene	UG/KG	6600	940000	3 J	420000	1100000
4-Methyl-2-Pentanone	UG/KG	1500 U	370000 U	12 U	30000 U	360000 U
Methylene Chloride	UG/KG	780 U	190000 U	6 U	15000 U	190000
Styrene	UG/KG	780 U	1200000	6 U	15000 U	190000 U
1,1,2,2-Tetrachloroethane	UG/KG	780 U	190000 U	6 U	15000 U	190000 U
Tetrachloroethene	UG/KG	780 U	230000	6 U	15000 U	190000 U
Toluene	UG/KG	10000	7000000	3 J	56000	4800000
1,1,1-Trichloroethane	UG/KG	780 U	880000	6 U	15000 U	190000 U
Trichloroethylene	UG/KG	780 U	300000	6 U	15000 U	120000 J
Xylenes (Total)	UG/KG	22000	3800000	6 U	1700000	4700000
						17000

**Table 1B**  
**Analytical Results - Semivolatile Organic Compounds**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		FCA-1 0-2	FCA-1 0-2DL	FCA-2	FCA-2DL	FCA2A 0-2	FCA2A 0-2DL
Laboratory Sample Number	70094003	70094003DL	70092001	70092001DL	70094005	70094005DL	
Sampling Date	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97	
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	
PARAMETERS	UNITS						
SEMI-VOLATILES							
Phenol	UG/KG	14000 U	70000 U	9000	9700 JD	6100 J	11000 JD
1,3-Dichlorobenzene	UG/KG	4200 U	21000 U	660 U	13000 U	6400 U	32000 U
1,4-Dichlorobenzene	UG/KG	4200 U	21000 U	480 J	13000 U	6400 U	32000 U
1,2-Dichlorobenzene	UG/KG	4200 U	21000 U	2000	13000 U	6400 U	32000 U
2-Methylphenol	UG/KG	14000 U	70000 U	1500 J	43000 U	21000 U	110000 U
4-Methylphenol	UG/KG	14000 U	70000 U	6000	6400 JD	21000 U	110000 U
Isophorone	UG/KG	4200 U	21000 U	690	13000 U	53000	57000 D
2,4-Dimethylphenol	UG/KG	14000 U	70000 U	2200 U	43000 U	21000 U	110000 U
2,4-Dichlorophenol	UG/KG	14000 U	70000 U	2200 U	43000 U	21000 U	110000 U
1,2,4-Trichlorobenzene	UG/KG	4200 U	21000 U	7300	8300 JD	6400 U	32000 U
Naphthalene	UG/KG	6200	21000 U	20000	28000 D	100000	110000 D
2-Methylnaphthalene	UG/KG	2900 J	21000 U	6400	7600 JD	18000	18000 JD
2,4,5-Trichlorophenol	UG/KG	70000 U	350000 U	11000 U	220000 U	110000 U	530000 U
Dimethylphthalate	UG/KG	4200 U	21000 U	660 U	13000 U	6400 U	32000 U
Acenaphthylene	UG/KG	1800 J	21000 U	1000	13000 U	3000 J	32000 U
Acenaphthene	UG/KG	1500 J	21000 U	1600	13000 U	6400 U	32000 U
Dibenzofuran	UG/KG	4200 U	21000 U	1700	13000 U	6400 U	32000 U
2,4-Dinitrotoluene	UG/KG	4200 U	21000 U	660 U	13000 U	6400 U	32000 U
Diethylphthalate	UG/KG	4200 U	21000 U	2500	13000 U	6400 U	32000 U
Fluorene	UG/KG	4200 U	21000 U	3100	13000 U	6400 U	32000 U
Pentachlorophenol	UG/KG	70000 U	350000 U	11000 U	220000 U	110000 U	530000 U
Phenanthrene	UG/KG	2400 J	21000 U	8900	11000 JD	12000	13000 JD
Anthracene	UG/KG	4200 U	21000 U	1800	13000 U	2300 J	32000 U
Carbazole	UG/KG	4200 U	21000 U	660 U	13000 U	6400 U	32000 U
Di-n-Butylphthalate	UG/KG	9400	9800 JD	29000	71000 D	58000	62000 D
Fluoranthene	UG/KG	3000 J	21000 U	4900	6200 JD	4900 J	32000 U
Pyrene	UG/KG	4900	21000 U	6000	6800 JD	12000	13000 JD
Butylbenzylphthalate	UG/KG	23000	24000 D	56000 E	120000 D	67000	74000 D
Benzo(a)Anthracene	UG/KG	2900 J	21000 U	2200	13000 U	5100 J	32000 U
Chrysene	UG/KG	3400 J	21000 U	2800	13000 U	6300 J	32000 U
Bis(2-Ethylhexyl)Phthalate	UG/KG	370000 E	320000 D	100000 E	320000 D	440000 E	460000 D
Di-n-Octylphthalate	UG/KG	2600 J	21000 U	4300	13000 U	2600 J	32000 U
Benzo(b)Fluoranthene	UG/KG	4200	21000 U	2200	13000 U	5200 J	32000 U
Benzo(k)Fluoranthene	UG/KG	4200 U	21000 U	840	13000 U	6400 U	32000 U
Benzo(a)Pyrene	UG/KG	2700 J	21000 U	1500	13000 U	2800 J	32000 U
Indeno(1,2,3-cd)Pyrene	UG/KG	2300 J	21000 U	660 U	13000 U	2200 J	32000 U
Dibenz(a,h)Anthracene	UG/KG	4200 U	21000 U	660 U	13000 U	6400 U	32000 U
Benzo(g,h,i)Perylene	UG/KG	3800 J	21000 U	980	13000 U	10000 J	32000 U

**Table 1B (cont.)**  
**Analytical Results - Semivolatile Organic Compounds**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	FCA2A 2-4 70094006 01/06/97 Soil (2-4)	FCA2A 2-4DL 70094006DL 01/06/97 Soil (2-4)	FCA-3 70092002 01/06/97 Soil (1-3)	FCA-3DL 70092002DL 01/06/97 Soil (1-3)	FCA-4 70092003 01/06/97 Soil (1-3)	FCA-4DL 70092003DL 01/06/97 Soil (1-3)
PARAMETERS	UNITS					
SEMI-VOLATILES						
Phenol	UG/KG	19000	30000 JD	1700	1900 JD	310 J
1,3-Dichlorobenzene	UG/KG	4400 U	44000 U	58 J	2300 U	130 U
1,4-Dichlorobenzene	UG/KG	4400 U	44000 U	120	2300 U	100 J
1,2-Dichlorobenzene	UG/KG	9100	44000 U	560	2100 U	370
2-Methylphenol	UG/KG	37000	150000 U	710	7500 U	450
4-Methylphenol	UG/KG	15000 U	150000 U	2600	3000 JD	3200
Isophorone	UG/KG	110000	140000 D	500	2300 U	860
2,4-Dimethylphenol	UG/KG	15000 U	150000 U	1700	2200 JD	1300
2,4-Dichlorophenol	UG/KG	15000 U	150000 U	380	7500 U	220 J
1,2,4-Trichlorobenzene	UG/KG	4400 U	44000 U	1300	1500 JD	210
Naphthalene	UG/KG	220000	300000 D	4300	6500 D	1700
2-Methylnaphthalene	UG/KG	46000	64000 D	3500	4600 D	1200
2,4,5-Trichlorophenol	UG/KG	74000 U	740000 U	480 J	39000 U	130 J
Dimethylphthalate	UG/KG	4400 U	44000 U	110 U	2300 U	130 U
Acenaphthylene	UG/KG	3000 J	44000 U	550	2300 U	1100
Acenaphthene	UG/KG	4400 U	44000 U	930	1100 JD	1200
Dibenzofuran	UG/KG	4400 U	44000 U	810	940 JD	1000
2,4-Dinitrotoluene	UG/KG	4400 U	44000 U	110 U	2300 U	110 U
Diethylphthalate	UG/KG	4400 U	44000 U	3200	4500 D	240
Fluorene	UG/KG	4900	44000 U	1400	2100 JD	2200
Pentachlorophenol	UG/KG	74000 U	740000 U	200 J	39000 U	61 J
Phenanthrene	UG/KG	58000	73000 D	4600	7300 D	6300
Anthracene	UG/KG	7000	44000 U	1800	2400 D	3100
Carbazole	UG/KG	2800 J	44000 U	680	1200 JD	1100
Di-n-Butylphthalate	UG/KG	220000	280000 D	5600	2300 U	1400
Fluoranthene	UG/KG	10000	44000 U	3100	5400 D	4800
Pyrene	UG/KG	40000	63000 D	4100	5700 D	6500
Butylbenzylphthalate	UG/KG	200000	330000 D	12000 E	27000 D	2000
Benzo(a)Anthracene	UG/KG	4400 U	44000 U	1600	2100 JD	2700
Chrysene	UG/KG	10000	15000 JD	2400	2800 D	3000
Bis(2-Ethylhexyl)Phthalate	UG/KG	1100000 E	1500000 D	26000 E	88000 D	19000 E
Di-n-Octylphthalate	UG/KG	7900	44000 U	2400	3200 D	2100
Benzo(b)Fluoranthene	UG/KG	2600 J	44000 U	2200	2300 D	3400
Benzo(k)Fluoranthene	UG/KG	4400 U	44000 U	820	800 JD	1200
Benzo(a)Pyrene	UG/KG	2200 J	44000 U	1400	1900 JD	2600
Indeno(1,2,3-cd)Pyrene	UG/KG	4400 U	44000 U	110 U	2300 U	130 U
Dibenz(a,h)Anthracene	UG/KG	4400 U	44000 U	110 U	2300 U	240
Benzo(g,h,i)Perylene	UG/KG	4400 U	44000 U	600	1000 JD	820

**Table 1B (cont.)**  
**Analytical Results - Semivolatile Organic Compounds**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne-Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	FCAS(0-1.5) 70141015	FCA-6 70092004	FCA-6DL 70092004DL	FCA7 0-2 70094001	FCA7 2-4 70094002	FCA7 2-4DL 70094002DL	FCA-8 2-4 70094004
PARAMETERS	UNITS						
<b>SEMI-VOLATILES</b>							
Phenol	UG/KG	190000	1000 J	40000 U	12000 U	62000	61000 JD
1,3-Dichlorobenzene	UG/KG	12000 U	610 U	12000 U	3700 U	23000 U	3600 U
1,4-Dichlorobenzene	UG/KG	12000 U	610 U	12000 U	3700 U	23000 U	3600 U
1,2-Dichlorobenzene	UG/KG	18000	610 U	12000 U	3700 U	23000 U	3600 U
2-Methylphenol	UG/KG	22000 J	2000 U	40000 U	12000 U	7600 U	76000 U
4-Methylphenol	UG/KG	840000	2000 U	40000 U	1700 U	7600 U	12000 U
Isophorone	UG/KG	68000	2000	12000 U	3700 U	63000	71000 D
2,4-Dimethylphenol	UG/KG	38000 U	2000 U	40000 U	12000 U	7600 U	3900 J
2,4-Dichlorophenol	UG/KG	38000 U	2000 U	40000 U	12000 U	7600 U	76000 U
1,2,4-Trichlorobenzene	UG/KG	60000	420 J	12000 U	3700 U	59000	69000 D
Naphthalene	UG/KG	380000	2600	12000 U	3800	140000	170000 D
2-Methylnaphthalene	UG/KG	140000	2700	12000 U	3400 J	49000	38000 D
2,4,5-Trichlorophenol	UG/KG	190000 U	10000 U	210000 U	62000 U	38000 U	380000 U
Dimethylphthalate	UG/KG	12000 U	350 J	12000 U	3700 U	11000	23000 U
Acenaphthylene	UG/KG	21000	640	12000 U	4300	9800	23000 U
Acenaphthene	UG/KG	42000	660	12000 U	2800 J	2300 U	23000 U
Dibenzofuran	UG/KG	42000	610 U	12000 U	3700 U	2300 U	3600 U
2,4-Dintrotoluene	UG/KG	12000 U	400 J	12000 U	3700 U	2300 U	23000 U
Diethylphthalate	UG/KG	46000	660	12000 U	3700 U	20000	23000 U
Fluorene	UG/KG	84000	1000	12000 U	3700 U	8100	23000 U
Pentchlurophenol	UG/KG	190000 U	10000 U	210000 U	62000 U	38000 U	380000 U
Phenanthrene	UG/KG	150000 B	4700	5500 JD	1500 J	30000	34000 D
Anthracene	UG/KG	32000	1300	12000 U	3700 U	5400	23000 U
Carbazole	UG/KG	43000	610 U	12000 U	3700 U	2300 U	23000 U
Di-n-Butylphthalate	UG/KG	580000	3200	4700 JD	2100 J	360000 E	330000 D
Fluoranthene	UG/KG	61000 B	4700	6100 JD	3700 U	15000	18000 JD
Pyrene	UG/KG	38000 B	6600	8600 JD	3700 U	18000	25000 D
Butylbenzylphthalate	UG/KG	530000	8200	12000 D	3700 U	1300000 E	1300000 D
Benzo(a)Anthracene	UG/KG	16000	2300	12000 U	3700 U	9000	23000 U
Chrysene	UG/KG	23000	2500	12000 U	3700 U	6000	23000 U
Bis(2-Ethylhexyl)Phthalate	UG/KG	940000	150000 E	550000 D	94000	1200000 E	1200000 D
Di-n-Octylphthalate	UG/KG	22000	39000 E	55000 D	13000	11000	23000 U
Benzo(b)Fluoranthene	UG/KG	14000	4800	4800 JD	3700 U	5800	23000 U
Benzo(k)Fluoranthene	UG/KG	9600 J	1600	12000 U	3700 U	1800 J	23000 U
Benzo(a)Pyrene	UG/KG	11000 J	3800	4300 JD	3700 U	4500	23000 U
Indeno(1,2,3-cd)Pyrene	UG/KG	12000 U	610 U	12000 U	3700 U	2300	23000 U
Dinez(a,h)Anthracene	UG/KG	12000 U	490 J	12000 U	3700 U	2300 U	23000 U
Benzo(g,h,i)Perylene	UG/KG	12000 U	4500	4700 JD	3600 J	1700	23000 U

**Table 1C**  
**Analytical Results - Pesticides/PCBs**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		FCA-1 0-2 70094003	FCA-2 70092001	FCA2A 0-2 70094005	FCA2A 2-4 70094006	FCA-3 70092002	FCA-4 70092003
Laboratory Sample Number		Sampling Date 01/06/97					
Sample Matrix		Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (2-4)	Soil (1-3)	Soil (1-3)
Sample Depth (feet below ground surface)							
PARAMETERS	UNITS						
PESTICIDES/PCB's							
delta BHC	UG/KG	230 U	260	180 U	120 U	95 U	100 U
gamma BHC	UG/KG	230 U	110 U	180 U	120 U	95 U	100 U
Aldrin	UG/KG	230 U	110 U	180 U	120 U	95 U	100 U
Heptachlor epoxide	UG/KG	230 U	110 U	180 U	120 U	95 U	100 U
Dieldrin	UG/KG	470 U	220 U	350 U	240 U	190 U	210 U
4,4'-DDE	UG/KG	1500	1500	2800	240 U	1300	520
Endosulfan II	UG/KG	470 U	220 U	350 U	240 U	190 U	210 U
4,4'-DDD	UG/KG	1400	370	350 U	710	490	920
Endosulfan sulfate	UG/KG	470 U	220 U	350 U	240 U	190 U	210 U
Methoxychlor	UG/KG	2300 U	1100 U	1800 U	1200 U	950 U	1000 U
alpha-Chlordane	UG/KG	860	400	220	170	1200	930
gamma-Chlordane	UG/KG	98 J	640	250	270	940	340
Aroclor-1248	UG/KG	34000	2200 U	3500 U	2400 U	24000	22000
Aroclor-1254	UG/KG	35000	2200 U	3500 U	2400 U	1900 U	2100 U
Aroclor-1260	UG/KG	4700 U	2200 U	3500 U	2400 U	8200	10000

**Table 1C (cont.)**  
**Analytical Results - Pesticides/PCBs**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		FCA5(0-1.5)	FCA-6	FCA-6DL	FCA-7 0-2	FCA7 2-4	FCA-8 2-4	FCA-8 2-4DL
Laboratory Sample Number	70141015	70092004	70092004DL	70092005	70094002	70094004	70094004	70094004DL
Sampling Date	01/09/97	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97
Sample Matrix	Soil (0-1.5)	Soil (0-2)			Soil (0-2)	Soil (2-4)	Soil (2-4)	Soil (2-4)
Sample Depth (feet below ground surface)								
PARAMETERS	UNITS							
PESTICIDES/PCB's								
delta BHC	UG/KG	26 U	100 U	510 U	4.1 U	130 U	410 U	4100 U
gamma BHC	UG/KG	26 U	100 U	510 U	4.1 U	83 J	410 U	4100 U
Aldrin	UG/KG	26 U	100 U	510 U	6.5	130 U	410 U	4100 U
Heptachlor epoxide	UG/KG	51	100 U	510 U	4.1 U	130 U	410 U	4100 U
Dieldrin	UG/KG	51 U	200 U	1000 U	13	250 U	810 U	8100 U
4,4'-DDE	UG/KG	350	5700 E	6400 D	15	1700	810 U	8100 U
Endosulfan II	UG/KG	51 U	200 U	1000 U	31	250 U	810 U	8100 U
4,4'-DDD	UG/KG	280	200 U	1000 U	8.2 U	640	810 U	8100 U
Endosulfan sulfate	UG/KG	51 U	200 U	1000 U	58	250 U	810 U	8100 U
Methoxychlor	UG/KG	260 U	1000 U	5100 U	7.6 J	1300 U	4100 U	41000 U
alpha-Chlordane	UG/KG	270	1200	1500 D	10	1400	410 U	4100 U
gamma-Chlordane	UG/KG	290	450	540 D	14	1300	410 U	4100 U
Aroclor-1248	UG/KG	510 U	30000	36000 D	82 U	2500 U	140000	140000
Aroclor-1254	UG/KG	510 U	2000 U	10000 U	82 U	2500 U	370000 E	430000
Aroclor-1260	UG/KG	510 U	21000	16000 D	82 U	2500 U	8100 U	81000 U

**Table 1D**  
**Analytical Results - Metals**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		FCA-1 0-2	FCA-2	FCA2A 0-2	FCA2A 2-4	FCA-3
Laboratory Sample Number	70094003	70092001	70094005	70094006	70092002	
Sampling Date	01/06/97	01/06/97	01/06/97	01/06/97	01/06/97	
Sample Matrix	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (2-4)	Soil (1-3)	
Sample Depth (feet below ground surface)						
PARAMETERS	UNITS					
METALS						
Aluminum	MG/KG	5690	5140	6720	3970	5140
Antimony	MG/KG	172.	48.0	231.	123.	27.5
Arsenic	MG/KG	7.42	4.31	12.4	0.414 U	16.2
Barium	MG/KG	3240	1360	2480	2900	899.
Beryllium	MG/KG	0.355 B	0.542	0.451 B	0.680	0.645
Cadmium	MG/KG	61.0	37.9	42.7	53.9	13.3
Calcium	MG/KG	16000	23100	13800	11600	15400
Chromium	MG/KG	624.	438.	1030	2700	233.
Cobalt	MG/KG	80.8	103.	2690	266.	22.1.
Copper	MG/KG	490.	349.	1380	1970	393.
Iron	MG/KG	38200	18100	71300	21800	96500
Lead	MG/KG	3360	3300	5260	13600	1390
Magnesium	MG/KG	2390	5780	3490	1600	7000
Manganese	MG/KG	744.	441.	1040	2410	534.
Mercury	MG/KG	10.1	18.7	4.47	36.3	6.43
Nickel	MG/KG	100.	45.6	192.	83.9	67.0
Potassium	MG/KG	513. B	500. B	415. B	182. B	482. B
Selenium	MG/KG	2.04	2.66	4.08	1.70	6.50
Silver	MG/KG	2.18	1.41	2.73	1.13 B	3.27
Sodium	MG/KG	366. B	47.3 U	75.8 U	52.7 U	235. B
Thallium	MG/KG	1.27 B	0.971 U	3.81	2.85	2.31
Vanadium	MG/KG	24.4	12.2	33.0	3.18	29.1
Zinc	MG/KG	1730	1680	5740	3850	646.

**Table 1D (cont.)**  
**Analytical Results - Metals**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		FCA-4 70092003	FCA5(0-1.5) 70141015	FCA-6 70092004	FCA7 0-2 70094001	FCA7 2-4 70094002	FCA-8 2-4 70094004
Laboratory Sample Number							
Sampling Date	01/06/97		01/09/97	01/06/97	01/06/97	01/06/97	01/06/97
Sample Matrix	Soil		Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(1-3)		(0-1.5)	(0-2)	(0-2)	(2-4)	(2-4)
PARAMETERS	UNITS						
METALS							
Aluminum	MG/KG	4010	4280	7280	1990	6810	6840
Antimony	MG/KG	28.9	125.	112.	26.7	132.	61.2
Arsenic	MG/KG	32.9	4.33 U	14.0	52.9	21.3 U	50.3
Barium	MG/KG	1180	1940	3180	370.	6880	2410
Beryllium	MG/KG	0.550	0.630 B	0.410 B	2.55 B	5.14 B	2.78 B
Cadmium	MG/KG	17.7	136.	143.	0.522 U	55.7	28.6
Calcium	MG/KG	22000	10300	16300	8100 B	16400 B	15700
Chromium	MG/KG	201.	2030	846.	1260	31100	1330
Cobalt	MG/KG	15.3	85.8	56.3	119. B	185. B	50.2 B
Copper	MG/KG	453.	1260	1140	1090	894.	1420
Iron	MG/KG	49300	35400	52500	721000	115000	275000
Lead	MG/KG	2020	10200	8130	1840	172000	7290
Magnesium	MG/KG	1370	1340 B	3500	1180 B	2000 B	2410 B
Manganese	MG/KG	269.	464.	380.	4470	1200	1450
Mercury	MG/KG	8.19	43.9	6.30	0.349	42.1	0.966
Nickel	MG/KG	101.	86.7	130.	1050	240.	276.
Potassium	MG/KG	578. B	231. B	443. B	266. U	655. U	265. U
Selenium	MG/KG	6.19	6.80 B	56.3	7.03 U	17.3 U	7.00 U
Silver	MG/KG	2.25	56.7	4.37	0.983 U	6.95 B	2.60 B
Sodium	MG/KG	386. B	552. U	172. B	1100 U	2710 U	1100 U
Thallium	MG/KG	0.928 U	11.3 U	2.25	22.6 U	55.7 U	22.5 U
Vanadium	MG/KG	36.2	16.0	38.5	42.9	6.65 B	45.2
Zinc	MG/KG	929.	2010	4620	1480	4430	4190

**Table 1E**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	FCA-1 0-2 70094003 01/06/97 Soil (0-2)	FCA-2 70092001 01/06/97 Soil (0-2)	FCA-2A 0-2 70094005 01/06/97 Soil (0-2)	FCA-2A 2-4 70094006 01/06/97 Soil (2-4)	FCA-3 70092002 01/06/97 Soil (1-3)	FCA-4 70092003 01/06/97 Soil (1-3)
PARAMETERS	UNITS					
DIOXINS/DIBENZOFURANS						
1,2,3,6,7,8-HxCDD	UG/KG	0.483 U	0.458 U	0.69 U	0.459 U	0.394 U
1,2,3,7,8,9-HxCDD	UG/KG	0.414 U	0.392 U	0.757 U	0.504 U	0.388 U
1,2,3,4,6,7,8-HpCDD	UG/KG	2.44	2.2	2.03	0.782	3.94
1,2,3,4,6,7,8,9-OCDD	UG/KG	67	27.6	17.3	14.2	38.8
2,3,7,8-TCDF	UG/KG	0.36	0.636	0.208 U	0.336	1.7
1,2,3,7,8-PeCDF	UG/KG	0.566 U	0.536 U	0.433	0.269 U	0.462 U
2,3,4,7,8-PeCDF	UG/KG	0.539 U	0.51 U	1.35	0.2 U	0.439 U
1,2,3,4,7,8-HxCDF	UG/KG	0.691 U	0.694	5.29	0.366 U	3.62
1,2,3,6,7,8-HxCDF	UG/KG	0.649 U	0.458 U	0.697	0.268 U	0.394 U
2,3,4,6,7,8-HxCDF	UG/KG	0.497 U	0.471 U	0.57	0.408 U	0.406 U
1,2,3,7,8,9-HxCDF	UG/KG	0.304 U	0.288 U	0.534 U	0.419 U	0.248 U
1,2,3,4,6,7,8-HpCDF	UG/KG	0.497 U	1.51	12.2	0.355 U	5.69
1,2,3,4,7,8,9-HpCDF	UG/KG	0.442 U	0.419 U	0.801 U	0.629 U	0.361 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	0.829 U	1.73	10.6	2.86	4.22
TOTAL TCDD	UG/KG	0.138 U	0.131 U	0.363 U	0.292 U	0.113 U
TOTAL PeCDD	UG/KG	0.774 U	0.732 U	0.747 U	0.6 U	0.631 U
TOTAL HxCDD	UG/KG	0.414 U	0.392 U	1.2	0.459 U	0.538
TOTAL HpCDD	UG/KG	3.39	4.54	3.57	0.782	7.01
TOTAL TCDF	UG/KG	1.16	2.15	29.9	0.336	7.06
TOTAL PeCDF	UG/KG	0.539 U	4.42	21.6	0.247	6.34
TOTAL HxCDF	UG/KG	0.304 U	1.2	14.7	0.237	13.2
TOTAL HpCDF	UG/KG	0.442 U	1.51	14	0.355 U	5.69
<i>TOTAL TCDD Equivalents</i>	UG/KG	0.13	0.20	1.52	0.058	0.67
						0.24

**Table 1E (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Furnace Courtyard Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	FCA5(0-1.5) 70141015 01/09/97 Soil (0-1.5)	FCA-6 70092004 01/06/97 Soil (0-2)	FCA7 0-2 70094001 01/06/97 Soil (0-2)	FCA7 2-4 70094002 01/06/97 Soil (2-4)	FCA-8 2-4 70094004 01/06/97 Soil (2-4)
PARAMETERS	UNITS				
DIOXINS/DIBENZOFURANS					
1,2,3,6,7,8-HxCDD	UG/KG	0.521 U	0.4007 U	0.41 U	0.51
1,2,3,7,8,9-HxCDD	UG/KG	0.38 U	0.379	0.351 U	0.471
1,2,3,4,6,7,8-HpCDD	UG/KG	3.13	9.6	0.703 U	39.7
1,2,3,4,6,7,8,9-OCDD	UG/KG	84.3	53.5	1.42	397
2,3,7,8-TCDF	UG/KG	0.0985 U	4.96	0.0937 U	0.165 U
1,2,3,7,8-PeCDF	UG/KG	0.535 U	0.521	0.48 U	0.273 U
2,3,4,7,8-PeCDF	UG/KG	0.901 U	1.03	0.457 U	0.203 U
1,2,3,4,7,8-HxCDF	UG/KG	1.28 U	4.1	0.586 U	0.294 U
1,2,3,6,7,8-HxCDF	UG/KG	1.29 U	0.4007 U	0.551 U	0.216 U
2,3,4,6,7,8-HxCDF	UG/KG	0.957 U	0.735	0.422 U	0.328 U
1,2,3,7,8,9-HxCDF	UG/KG	1.03 U	0.256 U	0.258 U	0.337 U
1,2,3,4,6,7,8-HpCDF	UG/KG	0.38 U	5.14	0.422 U	0.962
1,2,3,4,7,8,9-HpCDF	UG/KG	0.718 U	0.372 U	0.375 U	0.506 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	10.6	2.86	0.703 U	3.03
TOTAL TCDD	UG/KG	0.113 U	0.171	0.117 U	0.36 U
TOTAL PeCDD	UG/KG	1.03 U	0.995	0.656 U	0.572
TOTAL HxCDD	UG/KG	0.614	6.08	0.351 U	4.17
TOTAL HpCDD	UG/KG	6.89	18.7	0.703 U	76.5
TOTAL TCDF	UG/KG	0.262	25.5	0.0937 U	0.155
TOTAL PeCDF	UG/KG	50.6	13.1	0.457 U	64.6
TOTAL HxCDF	UG/KG	20.5	9.72	0.258 U	57.6
TOTAL HpCDF	UG/KG	0.38 U	5.14	0.375 U	4.72
<i>TOTAL TCDD Equivalents</i>	UG/KG	0.13	1.76	0.0014	0.905
					1.05

**TABLE 2**  
**STORAGE TANK AREA SOIL SAMPLES**

**Table 2A**  
**Analytical Results - Volatile Organic Compounds**  
**Storage Tank Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	STA-1(0-2) 70109002 01/07/97 Soil (0.5-2)	STA-2(0-2) 70109001 01/07/97 Soil (0.5-2)	STA-3(1-3) 70109003 01/07/97 Soil (1-3)
PARAMETERS	UNITS		
VOLATILES			
Acetone	UG/KG	15	720 U
Benzene	UG/KG	6 U	270 J
Chlorobenzene	UG/KG	6 U	430
Ethylbenzene	UG/KG	6 U	540
Toluene	UG/KG	7	890
Xylenes (Total)	UG/KG	6 U	3100
			1800 U
			2400
			2800
			5700
			3900
			19000

**Table 2B**  
**Analytical Results - Semivolatile Organic Compounds**  
**Storage Tank Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	STA-1(0-2) 70109002 01/07/97 Soil (0-2)	STA-1(0-2)DL 70109002DL 01/07/97 Soil (0-2)	STA-2(0-2) 70109001 01/07/97 Soil (0-2)	STA-2(0-2)DL 70109001DL 01/07/97 Soil (0-2)	STA-3(1-3) 70109003 01/07/97 Soil (1-3)	STA-3(1-3)DL 70109003DL 01/07/97 Soil (1-3)
PARAMETERS	UNITS					
SEMI-VOLATILES						
Phenol	UG/KG	380 U	3800 U	400 U	2000 U	3900 J
Isophorone	UG/KG	330	450 JD	120 U	600 U	1500 U
Naphthalene	UG/KG	1300	1700 D	2800	5000 D	4100
2-Methylnaphthalene	UG/KG	520	620 JD	9500 E	15000 D	6200 JD
Acenaphthylene	UG/KG	360	420 JD	120 U	600 U	1500 J
Acenaphthene	UG/KG	160	1100 U	120 U	600 U	1500 J
Dibenzofuran	UG/KG	110 U	1100 U	120 U	600 U	1000 J
Fluorene	UG/KG	440	1100 U	120 U	1400 D	1400 J
N-Nitrosodiphenylamine (1)	UG/KG	110 U	1100 U	120 U	600 U	370000 E
Phenanthrene	UG/KG	2400	3100 D	2700	3700 D	4400
Anthracene	UG/KG	570	630 JD	180	470 JD	1500
Di-n-Butylphthalate	UG/KG	310	520 JD	420	720 D	570000 E
Fluoranthene	UG/KG	1900	1800 D	1400	2000 D	3800
Pyrene	UG/KG	1600	3100 D	1200	2400 D	3600
Butylbenzylphthalate	UG/KG	110 U	1100 U	400	690 D	1500 U
Benzo(a)Anthracene	UG/KG	830	1300 D	710	970 D	1700
Chrysene	UG/KG	1300	1200 D	810	1200 D	2000
Bis(2-Ethylhexyl)Phthalate	UG/KG	17000 E	24000 D	8400 E	14000 D	26000
Di-n-Octylphthalate	UG/KG	110 U	470 JD	120 U	600 U	1500 U
Benzo(b)Fluoranthene	UG/KG	1200	1100 D	1400	1500 D	1600
Benzo(k)Fluoranthene	UG/KG	260	1100 U	270	470 JD	750 J
Benzo(a)Pyrene	UG/KG	850	970 JD	780	1000 D	1300 J
Indeno(1,2,3-cd)Pyrene	UG/KG	190	650 JD	280	950 D	770 J
Dibenz(a,h)Anthracene	UG/KG	62 J	1100 U	79 J	270 JD	1500 U
Benzo(g,h,i)Perylene	UG/KG	240	940 JD	320	1300 D	1100 J

**Table 2C**  
**Analytical Results - Pesticides/PCBs**  
**Storage Tank Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	STA-1(0-2) 70109002 01/07/97 Soil (0-2)	STA-2(0-2) 70109001 01/07/97 Soil (0-2)	STA-3(1-3) 70109003 01/07/97 Soil (1-3)	STA-3(1-3)DL 70109003DL 01/07/97 Soil (1-3)
PARAMETERS	UNITS			
PESTICIDES/PCBs				
beta-BHC	UG/KG	48 U	35 J	63 U
Aldrin	UG/KG	48 U	50 U	1400 E
4,4'-DDE	UG/KG	350	1400	1200
4,4'-DDD	UG/KG	480	770	850
alpha-Chlordane	UG/KG	320	610	510
gamma-Chlordane	UG/KG	65	190	84
Arochlor-1248	UG/KG	14000	14000	13000
Arochlor-1260	UG/KG	6800	5300	6700
				250 U
				1400 D
				890 D
				860 D
				730 D
				250 U
				23000 D
				5400 D

**Table 2D**  
**Analytical Results - Metals**  
**Storage Tank Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	STA-1(0-2) 70109002 01/07/97 Soil (0-2)	STA-2(0-2) 70109001 01/07/97 Soil (0-2)	STA-3(1-3) 70109003 01/07/97 Soil (1-3)
PARAMETERS	UNITS		
METALS			
Aluminum	MG/KG	3820	3190
Antimony	MG/KG	3.93	15.7
Arsenic	MG/KG	9.42	11.3
Barium	MG/KG	365.	899.
Beryllium	MG/KG	0.287 B	1.09
Cadmium	MG/KG	6.16	9.83
Calcium	MG/KG	5370	6130
Chromium	MG/KG	72.3	138.
Cobalt	MG/KG	12.4	15.9
Copper	MG/KG	138.	517.
Iron	MG/KG	23800	31700
Lead	MG/KG	545.	1180
Magnesium	MG/KG	2020	1240
Manganese	MG/KG	151.	221.
Mercury	MG/KG	0.851	1.91
Nickel	MG/KG	48.2	55.4
Potassium	MG/KG	687.	315. B
Selenium	MG/KG	1.37	2.24
Silver	MG/KG	0.780 B	2.39
Sodium	MG/KG	406. B	347. B
Thallium	MG/KG	1.38	1.11 B
Vanadium	MG/KG	33.2	26.8
Zinc	MG/KG	437.	1080
			11200

**Table 2E**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Storage Tank Area Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Sampling Date Sample Matrix Sample Depth (feet below ground surface)	STA-1(0-2) 70109002 01/07/97 Soil (0-2)	STA-2(0-2) 70109001 01/07/97 Soil (0-2)	STA-3(1-3) 70109003 01/07/97 Soil (1-3)
PARAMETERS	UNITS		
DIOXINS/BENZODUFORANS			
1,2,3,4,6,7,8-HpCDD	UG/KG	0.71 U	1.08
1,2,3,4,6,7,8,9-OCDD	UG/KG	7.34	15
2,3,7,8-TCDF	UG/KG	3.49	1.6
1,2,3,7,8-PeCDF	UG/KG	0.485 U	0.43 U
2,3,4,7,8-PeCDF	UG/KG	0.614	0.459 U
1,2,3,4,7,8-HxCDF	UG/KG	4.34	6.92
1,2,3,6,7,8-HxCDF	UG/KG	0.556 U	0.738
2,3,4,6,7,8-HxCDF	UG/KG	0.426 U	0.45
1,2,3,4,6,7,8-HpCDF	UG/KG	4.9	8.2
1,2,3,4,6,7,8,9-OCDF	UG/KG	5.51	10.2
TOTAL HxCDD	UG/KG	0.355 U	0.622
TOTAL HpCDD	UG/KG	0.71 U	1.99
TOTAL TCDF	UG/KG	16.3	9.21
TOTAL PeCDF	UG/KG	6.52	6.62
TOTAL HxCDF	UG/KG	6.86	17.3
TOTAL HpCDF	UG/KG	6.16	8.2
<b>TOTAL TCDD Equivalents</b>	<b>UG/KG</b>	<b>1.15</b>	<b>1.09</b>
			<b>2.85</b>

**TABLE 3**  
**YARD AREA SOIL BORINGS**

**Table 3A**  
**Analytical Results - Volatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)		YA-1(0-2) 70109004 C-5 01/07/97 Soil (0.5-2)	YA-1(7-9) 70109005 C-5 01/07/97 Soil (7-9)	BBD-D1 70109023 C-5 01/07/97 Soil (YA-1(7-9))	YA-1(14-16) 70109006 C-5 01/07/97 Soil (14-16)	YA-2(0-2) 70109007 C-13 01/07/97 Soil (0.5-2)	YA-2(4-6) 70109008 C-13 01/07/97 Soil (4-6)	YA-2(8-10) 70109009 C-13 01/07/97 Soil (8-10)
PARAMETERS	UNITS							
VOLATILES								
Acetone	UG/KG	13 U	99	28	11 U	16	27	11 U
Benzene	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
2-Butanone	UG/KG	13 U	12 U	11 U	11 U	12 U	12 U	11 U
Carbon Disulfide	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
Chloroform	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
1,2-Dichloroethene (Total)	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
Ethylbenzene	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
Tetrachloroethylene	UG/KG	6 U	6 U	6 U	5 U	6 U	3 J	6 U
Toluene	UG/KG	10	6 U	6 U	6 U	5 U	6 U	6 U
Trichloroethylene	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U
Xylenes (Total)	UG/KG	6 U	6 U	6 U	5 U	6 U	6 U	6 U

**Table 3A (cont.)**  
**Analytical Results - Volatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)	YA-3(0-2) 70109020 K-18 01/07/97 Soil (0.5-2)	BBD-D2 70109024 K-18 01/07/97 Soil (YA-3 (0.5-2))	YA-3(2-4) 70109021 K-18 01/07/97 Soil (2-4)	YA-3(4-6) 70109022 K-18 01/07/97 Soil (4-6)
PARAMETERS	UNITS			
VOLATILES				
Acetone	UG/KG	71	210	28
Benzene	UG/KG	2 J	4 J	12
2-Butanone	UG/KG	11 U	33	14 U
Carbon Disulfide	UG/KG	3 J	9	7 U
Chloroform	UG/KG	6 U	6 U	7 U
1,2-Dichloroethene (Total)	UG/KG	6 U	6 U	7 U
Ethylbenzene	UG/KG	6 U	1 J	12
Tetrachloroethylene	UG/KG	6 U	4 J	7 U
Toluene	UG/KG	8	7	18
Trichloroethylene	UG/KG	6 U	6 U	7 U
Xylenes (Total)	UG/KG	6 U	6 U	98

**Table 3A (cont.)**  
**Analytical Results - Volatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)	YA-4(0-2) 70109012	YA-4(3-5) 70109013	YA-4(6-8) 70109016	YA-5(0-2) 70109017	YA-5(3-5) 70109018	YA-5(6-8) 70109019
PARAMETERS	UNITS					
<b>VOLATILES</b>						
Acetone	UG/KG	11 U	230	190	19	68
Benzene	UG/KG	6 U	6 U	7 U	6 U	7 U
2-Butanone	UG/KG	11 U	63	57	12 U	13 U
Carbon Disulfide	UG/KG	6 U	3 J	2 J	6 U	7 U
Chloroform	UG/KG	6 U	3 J	7 U	6 U	7 U
1,2-Dichloroethene (Total)	UG/KG	6 U	8	7 U	6 U	7 U
Ethylbenzene	UG/KG	6 U	2 J	6 J	6 U	7 U
Tetrachloroethene	UG/KG	6 U	6 U	7 U	6 U	7 U
Toluene	UG/KG	5 J	19	9	5 J	4 J
Trichloroethylene	UG/KG	6 U	7	7 U	6 U	7 U
Xylenes (Total)	UG/KG	6 U	6 U	39	6 U	7 U

**Table 3B**  
**Analytical Results - Semivolatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-I(0-2)	YA-I(0-2)DL	YA-I(7-9)	YA-I(7-9)DL	BBD-DL	BBD-DIDL	YA-I(14-16)
Laboratory Sample Number	70109004	70109004DL	70109005	70109005DL	70109023	70109023DL	C-5	70109006
Grid Location	C-5	C-5	C-5	C-5	C-5	C-5	C-5	C-5
Sampling Date	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(7-9)	(7-9)	(YA-I(7-9))	(YA-I(7-9))	(14-16)	
PARAMETERS	UNITS							
SEMI-VOLATILES								
Phenol	UG/KG	260 J	2100 U	390 U	1900 U	380 U	1900 U	360 U
4-Methylphenol	UG/KG	150 J	2100 U	390 U	1900 U	380 U	1900 U	360 U
Isophorone	UG/KG	1800	2100 D	120 U	590 U	110 U	570 U	57 J
Naphthalene	UG/KG	900	1100 D	340	450 JD	81 J	570 U	110 U
2-Methylnaphthalene	UG/KG	1700	1900 D	770	840 D	87 J	570 U	110 U
2-Chloronaphthalene	UG/KG	130 U	640 U	120 U	590 U	110 U	570 U	110 U
Dimethylphthalate	UG/KG	130 U	640 U	120 U	590 U	110 U	640 D	63 J
Acenaphthylene	UG/KG	2600	2600 D	1300	1400 D	270	300 JD	110 U
Acenaphthene	UG/KG	570	690 D	520	630 D	180	570 U	110 U
Dibenzofuran	UG/KG	130 U	640 U	260	590 U	110 U	570 U	110 U
2,4-Dinitrotoluene	UG/KG	130 U	640 U	120 U	590 U	520	600 D	110 U
Fluorene	UG/KG	2000	2300 D	1900	2300 D	1400	570 U	110 U
Hexachlorobenzene	UG/KG	130 U	640 U	120 U	590 U	110 U	9600 U	1800 U
Pentachlorophenol	UG/KG	2200 U	11000 U	2000 U	10000 U	1900 U	3900 D	100 J
Phenanthrene	UG/KG	15000 E	13000 D	14000 E	13000 D	4600	1300 D	40 J
Anthracene	UG/KG	3000	2600 D	2300	2400 D	1400	370 JD	110 U
Carbazole	UG/KG	130 U	640 U	230	590 U	340	570 U	110 U
Di-n-Butylphthalate	UG/KG	680	420 JD	120 U	590 U	110 U	3900 D	120
Fluoranthene	UG/KG	11000 E	8500 D	8700 E	8400 D	7600 E	6200 D	160
Pyrene	UG/KG	12000 E	16000 D	12000 E	12000 D	5400	570 U	110 U
Butylbenzylphthalate	UG/KG	310	580 JD	120 U	590 U	110 U	1900 D	81 J
Benzo(a)Anthracene	UG/KG	6700	7100 D	4000	4200 D	1800	1900 D	74 J
Chrysene	UG/KG	7000 E	7300 D	4300	4700 D	1800	1900 D	37 J
Bis(2-Ethylhexyl)Phthalate	UG/KG	720	1200 D	52 J	590 U	480	700 D	83 J
Benzo(b)Fluoranthene	UG/KG	6600	4500 D	2900	2500 D	1500	1000 D	110 U
Benzo(k)Fluoranthene	UG/KG	1900	1900 D	850	750 D	440	520 JD	60 J
Benzo(a)Pyrene	UG/KG	7000 E	5900 D	3300	3200 D	1300	1200 D	110 U
Indeno(1,2,3-cd)Pyrene	UG/KG	1200	2800 D	800	1400 D	350	380 JD	110 U
Dibenz(a,h)Anthracene	UG/KG	470	1000 D	290	500 JD	120	570 U	110 U
Benzo(e,h,i)Perylene	UG/KG	1500	4200 D	1000	2000 D	450	480 JD	110 U

Table 3B (cont.)  
**Analytical Results - Semivolatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-2(0-2)	YA-2(4-6)	YA-2(8-10)
Laboratory Sample Number		70109007	70109008	70109009
Grid Location		C-13	C-13	C-13
Sampling Date		01/07/97	01/07/97	01/07/97
Sample Matrix		Soil (0-2)	Soil (4-6)	Soil (8-10)
PARAMETERS	UNITS			
SEMI-VOLATILES				
Phenol	UG/KG	400 U	390 U	380 U
4-Methylphenol	UG/KG	400 U	390 U	380 U
Isophorone	UG/KG	120 U	120 U	110 U
Naphthalene	UG/KG	780	48 J	110 U
2-Methylnaphthalene	UG/KG	380	120 U	110 U
2-Chloronaphthalene	UG/KG	120 U	120 U	110 U
Dimethylphthalate	UG/KG	120 U	120 U	110 U
Acenaphthylene	UG/KG	1100	100 J	110 U
Acenaphthene	UG/KG	86 J	120 U	110 U
Dibenzofuran	UG/KG	120 U	120 U	110 U
2,4-Dinitrotoluene	UG/KG	120 U	120 U	110 U
Fluorene	UG/KG	210	120 U	110 U
Hexachlorobenzene	UG/KG	120 U	120 U	110 U
Pentachlorophenol	UG/KG	2000 U	2000 U	2000 U
Phenanthrene	UG/KG	1500	69 J	110 U
Anthracene	UG/KG	600	46 J	110 U
Carbazole	UG/KG	46 J	120 U	110 U
Di-n-Butylphthalate	UG/KG	160	75 J	110 U
Fluoranthene	UG/KG	1700	84 J	110 U
Pyrene	UG/KG	3000	150	110 U
Butylbenzylphthalate	UG/KG	120 U	120 U	110 U
Benzo(a)Anthracene	UG/KG	2200	130	110 U
Chrysene	UG/KG	2600	130	110 U
Bis(2-Ethylhexyl)Phthalate	UG/KG	440	140	110 U
Benzo(b)Fluoranthene	UG/KG	2800	170	110 U
Benzo(k)Fluoranthene	UG/KG	530	70 J	110 U
Benzo(a)Pyrene	UG/KG	2300	100 J	110 U
Indeno(1,2,3-cd)Pyrene	UG/KG	890	49 J	110 U
Dibenz(a,h)Anthracene	UG/KG	320	120 U	110 U
Benzo(g,h,i)Perylene	UG/KG	1100	68 J	110 U

Table 3B (cont.)  
**Analytical Results - Semivolatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)	YA-3(0-2) 70109020	YA-3(0-2)DL 70109020DL	BBD-D2 70109024	BBD-D2DL 70109024DL	YA-3(2-4) 70109021	YA-3(2-4)DL 70109021DL	YA-3(4-6) 70109022
PARAMETERS	UNITS						
<b>SEMI-VOLATILES</b>							
Phenol	UG/KG	380 U	3800 U	420 U	4200 U	460 U	4600 U
4-Methylphenol	UG/KG	380 U	3800 U	420 U	4200 U	460 U	4600 U
Isophorone	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Naphthalene	UG/KG	1500	2200 D	2600	3200 D	28000 E	23000 D
2-Methylnaphthalene	UG/KG	920	9400 D	1500	4900 D	18000 E	17000 D
2-Chloronaphthalene	UG/KG	110 U	1100 U	130 U	1300 U	110 J	1400 U
Dimethylphthalate	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Acenaphthylene	UG/KG	6300 E	6500 D	8700 E	7400 D	7800 E	6800 D
Acenaphthene	UG/KG	3800	4800 D	4800	5200 D	4600	4600 D
Dibenzofuran	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
2,4-Dinitrotoluene	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Fluorene	UG/KG	14000 E	13000 D	18000 E	13000 D	12000 E	9800 D
Hexachlorobenzene	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Pentachlorophenol	UG/KG	1900 U	19000 U	2200 U	22000 U	2400 U	24000 U
Phenanthrene	UG/KG	22000 E	22000 D	29000 E	19000 D	44000 E	35000 D
Anthracene	UG/KG	8900 E	9700 D	13000 E	9900 D	7300	7800 D
Carbazole	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Di-n-Butylphthalate	UG/KG	3900	4700 D	1500	1600 D	140 U	760 JD
Fluoranthene	UG/KG	32000 E	29000 D	64000 E	26000 D	34000 E	17000 D
Pyrene	UG/KG	30000 E	49000 D	37000 E	51000 D	29000 E	31000 D
Butylbenzylphthalate	UG/KG	110 U	1100 U	130 U	1300 U	140 U	1400 U
Benzo(a)Anthracene	UG/KG	19000 E	18000 D	19000 E	18000 D	16000 E	14000 D
Chrysene	UG/KG	9300 E	21000 D	11000 E	21000 D	10000 E	16000 D
Bis(2-Ethylhexyl)Phthalate	UG/KG	5400	6000 D	11000 E	12000 D	2500	2500 D
Benzo(b)Fluoranthene	UG/KG	13000 E	12000 D	23000 E	14000 D	9900 E	9200 D
Benzo(k)Fluoranthene	UG/KG	3100	4500 D	3800	3500 D	1300	2600 D
Benzo(a)Pyrene	UG/KG	10000 E	13000 D	16000 E	13000 D	9300 E	9800 D
Indeno(1,2,3-cd)Pyrene	UG/KG	1900	4000 D	2000	3700 D	1500	2600 D
Dibenz(a,h)Anthracene	UG/KG	740	1500 D	760	1300 D	590	990 JD
Benzo(g,h,i)Perylene	UG/KG	2200	5500 D	2400	5500 D	1900	3900 D

Table 3B (cont.)  
**Analytical Results - Semivolatile Organic Compounds**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-4(0-2) 70109012	YA-4(3-5) 70109013	YA-4(6-8) 70109016	YA-5(0-2) 70109017	YA-5(0-2)DL 70109017DL	YA-5(3-5) 70109018	YA-5(6-8) 70109019	
Laboratory Sample Number	K-10	K-10	K-10	H-12	H-12	H-12	H-12	H-12	
Grid Location	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	
Sampling Date	Soil (0-2)	Soil (3-5)	Soil (6-8)	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (3-5)	Soil (6-8)	
Sample Matrix	Sample Depth (feet below ground surface)								
PARAMETERS		UNITS							
SEMI-VOLATILES									
Phenol	UG/KG	380 U	430 U	460 U	380 U	1900 U	440 U	530 U	
4-Methylphenol	UG/KG	380 U	430 U	460 U	380 U	1900 U	440 U	530 U	
Isophorone	UG/KG	2200	130 U	140 U	170	580 U	130 U	160 U	
Naphthalene	UG/KG	570	1400	430	460	450 JD	310	260	
2-Methylnaphthalene	UG/KG	230	600	280	220	580 U	140	160 U	
2-Chloronaphthalene	UG/KG	110 U	130 U	140 U	120 U	580 U	130 U	160 U	
Dimethylphthalate	UG/KG	52 J	130 U	140 U	120 U	580 U	130 U	160 U	
Acenaphthylene	UG/KG	1300	620	780	180	580 U	130 U	270	
Acenaphthene	UG/KG	51 J	200	650	43 J	580 U	140	300	
Dibenzofuran	UG/KG	40 J	79 J	170	120 U	580 U	150	200	
2,4-Dinitrotoluene	UG/KG	110 U	130 U	120 J	120 U	580 U	130 U	160 U	
Fluorene	UG/KG	270	700	300	83 J	580 U	280	390	
Hexachlorobenzene	UG/KG	72 J	130 U	140 U	120 U	580 U	130 U	160 U	
Pentachlorophenol	UG/KG	1900 U	850 J	2400 U	2000 U	9900 U	2300 U	2700 U	
Phenanthrene	UG/KG	1100	2600	1500	720	700 D	1800	1000	
Anthracene	UG/KG	780	650	900	250	200 JD	250	330	
Carbazole	UG/KG	110 U	98 J	140	57 J	580 U	220	190	
Di-n-Butylphthalate	UG/KG	410	130 U	140 U	120 U	580 U	130 U	160 U	
Fluoranthene	UG/KG	2300	2500	3900	2700	1900 D	4700	1600	
Pyrene	UG/KG	2900	3200	3000	2300	3100 D	3400	1600	
Butylbenzylphthalate	UG/KG	110 U	88 J	140 U	44 J	580 U	130 U	160 U	
Benzo(a)Anthracene	UG/KG	2400	2200	2300	3000	2100 D	3400	1200	
Chrysene	UG/KG	2900	2700	2500	2600	3600 D	4400	1300	
Bis(2-Ethylhexyl)Phthalate	UG/KG	2900	280	140 U	14000 E	14000 D	280	360	
Benzo(b)Fluoranthene	UG/KG	3500	1900	2700	4400	3600 D	7200 E	1700	
Benzo(k)Fluoranthene	UG/KG	930	840	860	1300	680 D	1700	620	
Benzo(a)Pyrene	UG/KG	2200	2000	2800	2800	2100 D	3900	1100	
Indeno(1,2,3-cd)Pyrene	UG/KG	480	820	940	1600	1300 D	2200	860	
Dibenz(a,h)Anthracene	UG/KG	180	320	350	530	470 JD	800	280	
Benzo(g,h,i)Perylene	UG/KG	560	1000	940	1900	2100 D	2500	1100	

**Table 3C**  
**Analytical Results - Pesticides/PCBs**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-1(0-2)	YA-1(7-9)	BBD-DI	YA-1(14-16)	YA-2(0-2)	YA-2(0-2)DL	YA-2(4-6)	YA-2(8-10)
Laboratory Sample Number		70109004	70109005	70109023	70109006	70109007	70109007DL	70109008	70109009
Grid Location		C-5	C-5	C-5	C-5	C-13	C-13	C-13	C-13
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(7-9)	(YA-1(7-9))	(14-16)	(0-2)	(0-2)	(4-6)	(8-10)
PARAMETERS	UNITS								
PESTICIDES/PCB's									
alpha-BHC	UG/KG	21 U	2 U	1.9 U	1.8 U	2 U	10 U	2 U	1.9 U
beta-BHC	UG/KG	21 U	2 U	1.9 U	1.8 U	2 U	10 U	2 U	1.9 U
Heptachlor Epoxide	UG/KG	55	2 U	1.9 U	1.8 U	2 U	10 U	0.54 J	1.9 U
4,4'-DDE	UG/KG	120	8.8	30	0.84 J	2 J	2.7 JD	4 U	3.8 U
Endrin	UG/KG	43 U	3.9 U	3.8 U	3.6 U	13	16 JD	47	3.8 U
Endosulfan II	UG/KG	340	3.9 U	48	3.6 U	4 U	20 U	4 U	3.8 U
4,4'-DDD	UG/KG	180	3.9 U	17	3.6 U	10	20 U	4 U	3.8 U
Endosulfan sulfate	UG/KG	43 U	3.9 U	3.8 U	3.6 U	4 U	20 U	4 U	3.8 U
4,4'-DDT	UG/KG	43 U	3.9 U	3.8 U	3.6 U	84 E	93 D	4 U	3.8 U
alpha-Chlordane	UG/KG	58	4.5	1.9 U	1.8 U	36 E	44 D	2 U	1.9 U
gamma-Chlordane	UG/KG	19 J	2 U	1.9 U	1.8 U	55 E	66 D	1.2 J	1.9 U
Arochlor-1248	UG/KG	2100	330	570	54	40 U	200 U	40 U	38 U
Arochlor-1260	UG/KG	8200	1200	870	36 U	40 U	200 U	40 U	38 U

**Table 3C (cont.)**  
**Analytical Results - Pesticides/PCBs**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-3(0-2)	BBD-D2	BBD-D2DL	YA-3(2-4)	YA-3(2-4)DL	YA-3(4-6)
Laboratory Sample Number		70109020	70109024	70109024DL	70109021	70109021DL	70109022
Grid Location		K-18	K-18	K-18	K-18	K-18	K-18
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(YA-3(0-2))	(YA-3(0-2))	(2-4)	(2-4)	(4-6)
PARAMETERS	UNITS						
PESTICIDES/PCB's							
alpha-BHC	UG/KG	37 J	53 U	210 U	23 U	58 U	3 U
beta-BHC	UG/KG	47 U	53 U	210 U	23 U	58 U	3 U
Heptachlor Epoxide	UG/KG	47 U	100	130 JD	23 U	58 U	3 U
4,4'-DDE	UG/KG	380	330	390 JD	460	480 D	26
Endrin	UG/KG	95 U	100 U	420 U	46 U	120 U	6.1 U
Endosulfan II	UG/KG	1100	100 U	420 U	920 E	1200 D	6.1 U
4,4'-DDD	UG/KG	840	570	630 D	920 E	830 D	22
Endosulfan sulfate	UG/KG	340	62 J	420 U	46 U	120 U	6.1 U
4,4'-DDT	UG/KG	95 U	160	180 JD	860 E	120 U	6.1 U
alpha-Chlordane	UG/KG	420	1000 E	1300 D	23 U	58 U	3 U
gamma-Chlordane	UG/KG	750	1300 E	1800 D	23 U	58 U	3 U
Arochlor-1248	UG/KG	15000	9200	10000 D	1800	4200 D	180
Arochlor-1260	UG/KG	7500	3400	5000 D	4100	5600 D	61 U

**Table 3C (cont.)**  
**Analytical Results - Pesticides/PCBs**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-4(0-2)	YA-4(0-2)DL	YA-4(3-5)	YA-4(6-8)	YA-5(0-2)	YA-5(3-5)	YA-5(6-8)
Laboratory Sample Number		70109012	70109012DL	70109013	70109016	70109017	70109018	70109019
Grid Location		K-10	K-10	K-10	K-10	II-12	II-12	II-12
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(3-5)	(6-8)	(0-2)	(3-5)	(6-8)
PARAMETERS	UNITS							
PESTICIDES/PCB's								
alpha-BHC	UG/KG	47 U	950 U	23 J	23 U	48 U	2.2 U	2.7 U
beta-BHC	UG/KG	47 U	950 U	55 U	23 U	48 U	2.2 U	1.3 J
Heptachlor Epoxide	UG/KG	47 U	950 U	55 U	23 U	48 U	2.2 U	2.7 U
4,4'-DDE	UG/KG	950	1100 JD	130	46 U	97 U	4.4 U	3 J
Endrin	UG/KG	95 U	1900 U	110 U	46 U	97 U	4.4 U	5.4 U
Endosulfan II	UG/KG	95 U	1900 U	110 U	46 U	97 U	4.4 U	5.4 U
4,4'-DDD	UG/KG	95 U	1900 U	110 U	46 U	130	4.4 U	6.9
Endosulfan sulfate	UG/KG	95 U	1900 U	110 U	46 U	97 U	4.4 U	5.4 U
4,4'-DDT	UG/KG	95 U	1900 U	110 U	46 U	97 U	4.4 U	5.4 U
alpha-Chlordane	UG/KG	47 U	950 U	55 U	23 U	48 U	2.2 U	2.7 U
gamma-Chlordane	UG/KG	47 U	950 U	55 U	23 U	48 U	2.2 U	2.7 U
Arochlor-1248	UG/KG	130000 E	220000 D	21000	5000	8200	140	390
Arochlor-1260	UG/KG	11000	19000 U	5400	460 U	5200	100	300

**Table 3D**  
**Analytical Results - Metals**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-1(0-2)	YA-1(7-9)	BBD-D1	YA-1(14-16)	YA-2(0-2)	YA-2(4-6)	YA-2(8-10)
Laboratory Sample Number	70109004	70109005	70109023	70109006	70109007	70109008	70109009	
Grid Location	C-5	C-5	C-5	C-5	C-13	C-13	C-13	
Sampling Date	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Depth (feet below ground surface)	(0-2)	(7-9)	(YA-1(7-9))	(14-16)	(0-2)	(4-6)	(8-10)	
PARAMETERS	UNITS							
METALS								
Aluminum	MG/KG	7830	9180	7650	3710	3760	6760	9990
Antimony	MG/KG	70.9	1.99	5.37	0.120 U	7.63	10.7	0.127 U
Arsenic	MG/KG	34.8	7.74	8.84	2.46	97.9	22.9	3.30
Barium	MG/KG	2220	200.	224.	31.3	1620	5320	45.9
Beryllium	MG/KG	0.904 B	0.635	0.576	0.250 B	0.399 B	0.537 B	0.482
Cadmium	MG/KG	85.5	1.68	3.25	0.347 B	0.906 B	23.9	0.0196 U
Calcium	MG/KG	17400	5400	6380	1300	369. B	2090 B	604
Chromium	MG/KG	455.	25.1	34.7	7.49	55.6	40.8	14.5
Cobalt	MG/KG	26.1 B	7.48	7.48	3.82 B	8.07 B	6.77 B	5.39 B
Copper	MG/KG	1710	90.9	102.	13.4	225.	148.	11.3
Iron	MG/KG	129000	22300	24100	9730	95600	88500	18100
Lead	MG/KG	3240	942.	1300	78.1	1350	2280	9.05
Magnesium	MG/KG	4920 B	2790	3020	1270	209. B	1050 B	2350
Manganese	MG/KG	779.	378.	387.	123.	505.	391.	154
Mercury	MG/KG	1.71	0.181	0.214	0.109 U	1.01	0.181	0.115 U
Nickel	MG/KG	950.	23.7	26.0	8.29	26.8	39.7	14.4
Potassium	MG/KG	833. B	1230	1060	308. B	265. B	271. B	688
Selenium	MG/KG	24.4	0.845	1.66	0.249 U	3.93 B	2.73 U	0.264 U
Silver	MG/KG	8.87 B	0.549 B	0.208 B	0.0348 U	0.386 U	0.632 B	0.0369 U
Sodium	MG/KG	457. U	176. B	40.7 U	119. B	434. U	428. U	41.4 U
Thallium	MG/KG	9.39 U	1.19	1.16	0.802 U	8.90 U	8.79 U	1.05 B
Vanadium	MG/KG	42.5	23.2	21.2	10.4	45.7	15.3	23.3
Zinc	MG/KG	3260	330.	994.	97.4	939.	11700	326

Table 3D (cont.)  
 Analytical Results - Metals  
 Yard Area Soil Borings  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID		YA-3(0-2)	BBD-D2	YA-3(2-4)	YA-3(4-6)
Laboratory Sample Number		70109020	70109024	70109021	70109022
Grid Location		K-18	K-18	K-18	K-18
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(YA-3(0-2))	(2-4)	(4-6)
PARAMETERS	UNITS				
METALS					
Aluminum	MG/KG	3280	4400	5290	11600
Antimony	MG/KG	44.4	23.4	22.7	8.77
Arsenic	MG/KG	111.	121.	65.7	80.2
Barium	MG/KG	1430	1740	1730	364.
Beryllium	MG/KG	0.718 B	1.99 B	0.523 B	1.07
Cadmium	MG/KG	28.5	23.0	15.9	5.04
Calcium	MG/KG	8420	12200	20400	5140
Chromium	MG/KG	270.	379.	217.	274.
Cobalt	MG/KG	29.3 B	36.4 B	15.6	12.2
Copper	MG/KG	847.	881.	546.	466.
Iron	MG/KG	95100	101000	56500	41900
Lead	MG/KG	4780	3770	2170	575.
Magnesium	MG/KG	1070 B	1590 B	2330	4710
Manganese	MG/KG	528.	596.	424.	323.
Mercury	MG/KG	2.59	2.65	3.92	7.11
Nickel	MG/KG	129.	158.	114.	44.9
Potassium	MG/KG	430. B	504. B	835.	1880
Selenium	MG/KG	43.4	10.7	10.1	2.91
Silver	MG/KG	2.70 B	2.55 B	3.55	2.61
Sodium	MG/KG	409. U	452. U	70.6 B	150. B
Thallium	MG/KG	8.40 U	9.27 U	1.97	2.12
Vanadium	MG/KG	37.8	43.8	38.9	40.8
Zinc	MG/KG	3350	3940	1700	719.

**Table 3D (cont.)**  
**Analytical Results - Metals**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-4(0-2)	YA-4(3-5)	YA-4(6-8)	YA-5(0-2)	YA-5(3-5)	YA-5(6-8)
Laboratory Sample Number		70109012	70109013	70109016	70109017	70109018	70109019
Grid Location		K-10	K-10	K-10	II-12	II-12	II-12
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil (0-2)	Soil (3-5)	Soil (6-8)	Soil (0-2)	Soil (3-5)	Soil (6-8)
Sample Depth (feet below ground surface)							
PARAMETERS	UNITS						
METALS							
Aluminum	MG/KG	2450	4000	7910	5060	3890	7480
Antimony	MG/KG	13.4	16.2	1.68	3.37	2.52	5.18
Arsenic	MG/KG	4.88	15.7	26.0	8.72	7.90	28.8
Barium	MG/KG	336.	1090	293.	273.	979.	1320
Beryllium	MG/KG	0.219 B	0.452 B	0.648	0.423 B	0.312 B	0.553 B
Cadmium	MG/KG	4.73	9.06	2.06	24.7	0.927	9.61
Calcium	MG/KG	4510	7320	8620	10800	23900	125000
Chromium	MG/KG	73.2	132.	122.	51.7	32.4	227.
Cobalt	MG/KG	7.14	28.3	8.65	6.87	3.37 B	7.53 B
Copper	MG/KG	120.	1870	242.	84.0	102.	155.
Iron	MG/KG	11000	45000	32500	26200	35200	67000
Lead	MG/KG	1110	1880	876.	520.	1240	1490
Magnesium	MG/KG	3040	1160	3880	1660	3390	4650
Manganese	MG/KG	69.4	299.	388.	222.	210.	437.
Mercury	MG/KG	5.91	1.68	2.97	1.56	0.362	2.12
Nickel	MG/KG	13.2	41.2	147.	17.0	15.7	26.4
Potassium	MG/KG	411. B	490. B	1340	686.	507. B	1100
Selenium	MG/KG	0.734	2.84	1.20	1.30	3.46	4.40
Silver	MG/KG	0.667 B	2.67	1.56	0.414 B	0.535 B	2.08
Sodium	MG/KG	54.2 B	47.5 U	54.6 B	162. B	85.6 B	57.4 U
Thallium	MG/KG	0.841 U	1.14 B	1.46	1.05 B	0.984 U	1.54 B
Vanadium	MG/KG	25.8	25.6	30.2	25.4	12.1	23.9
Zinc	MG/KG	389.	1450	797.	287.	614.	2180

**Table 3E**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Soil Borings**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)	YA-1(0-2) 70109004 C-5 01/07/97 Soil (0-2)	YA-1(7-9) 70109005 C-5 01/07/97 Soil (7-9)	BBD-D1 70109023 C-5 01/07/97 Soil (YA-1(7-9))	YA-1(14-16) 70109006 C-5 01/07/97 Soil (14-16)	YA-2(0-2) 70109007 C-13 01/07/97 Soil (0-2)	YA-2(4-6) 70109008 C-13 01/07/97 Soil (4-6)	YA-2(8-10) 70109009 C-13 01/07/97 Soil (8-10)
PARAMETERS	UNITS	DIOXINS/BENZODUFORANS					
2,3,7,8-TCDD	UG/KG	0.708 U	0.115 U	0.116 U	0.107 U	0.122 U	0.114 U
1,2,3,7,8-PeCDD	UG/KG	1.09 U	0.645 U	0.649 U	0.598 U	0.681 U	0.636 U
1,2,3,4,7,8-HxCDD	UG/KG	0.691 U	0.45 U	0.452 U	0.416 U	0.475 U	0.443 U
1,2,3,6,7,8-HxCDD	UG/KG	0.522 U	0.403 U	0.406 U	0.373 U	0.426 U	0.398 U
1,2,3,7,8,9-HxCDD	UG/KG	0.558 U	0.346 U	0.348 U	0.32 U	0.365 U	0.341 U
1,2,3,4,6,7,8-HpCDD	UG/KG	0.888 U	0.692 U	0.696 U	0.64 U	0.73 U	0.682 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	5.07	1.15	1.18	0.768 U	1.71	0.818 U
2,3,7,8-TCDF	UG/KG	4.77	0.127	0.301	0.0854 U	0.259	0.0909 U
1,2,3,7,8-PeCDF	UG/KG	0.55	0.473 U	0.475 U	0.437 U	0.499 U	0.466 U
2,3,4,7,8-PeCDF	UG/KG	0.849	0.45 U	0.452 U	0.416 U	0.475 U	0.443 U
1,2,3,4,7,8-HxCDF	UG/KG	13.8	1.08	1.22	0.534 U	0.608 U	0.568 U
1,2,3,6,7,8-HxCDF	UG/KG	1.12	0.542 U	0.545 U	0.501 U	0.572 U	0.534 U
2,3,4,6,7,8-HxCDF	UG/KG	0.295 U	0.415 U	0.417 U	0.381 U	0.438 U	0.409 U
1,2,3,7,8,9-HxCDF	UG/KG	0.301 U	0.254 U	0.255 U	0.235 U	0.268 U	0.25 U
1,2,3,4,6,7,8-HpCDF	UG/KG	79	3.43	6.72	0.385	1.46	0.409 U
1,2,3,4,7,8,9-HpCDF	UG/KG	0.398 U	0.369 U	0.371 U	0.341 U	0.389 U	0.364 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	206	3.71	4.89	0.64 U	1.07	0.682 U
TOTAL TCDD	UG/KG	0.708 U	0.115 U	0.116 U	0.107 U	0.122 U	0.114 U
TOTAL PeCDD	UG/KG	1.09 U	0.645 U	0.649 U	0.598 U	0.681 U	0.636 U
TOTAL HxCDD	UG/KG	0.934	0.346 U	0.348 U	0.32 U	0.365 U	0.341 U
TOTAL HpCDD	UG/KG	0.888 U	0.692 U	0.696 U	0.64 U	0.73 U	0.682 U
TOTAL TCDF	UG/KG	13.4	0.391	1.43	0.0854 U	0.375	0.0909 U
TOTAL PeCDF	UG/KG	6.99	0.45 U	1.11	0.416 U	0.475 U	0.443 U
TOTAL HxCDF	UG/KG	24.4	1.82	2.08	0.235 U	0.304	0.25 U
TOTAL HpCDF	UG/KG	79.8	3.88	6.72	0.385	1.46	0.364 U
<b>TOTAL TCDD Equivalents</b>	<b>UG/KG</b>	<b>3.42</b>	<b>0.16</b>	<b>0.23</b>	<b>0.0039</b>	<b>0.043</b>	<b>0</b>

Table 3E (cont.)  
 Analytical Results - Dioxins/Dibenzofurans  
 Yard Area Soil Borings  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID		YA-3(0-2)	BBD-D2	YA-3(2-4)	YA-3(4-6)
Laboratory Sample Number		70109020	70109024	70109021	70109022
Grid Location		K-18	K-18	K-18	K-18
Sampling Date		01/07/97	01/07/97	01/07/97	01/07/97
Sample Matrix		Soil (0-2)	Soil (YA-3(0-2))	Soil (2-4)	Soil (4-6)
PARAMETERS	UNITS				
DIOXINS/BENZODUFORANS					
2,3,7,8-TCDD	UG/KG	0.126 U	0.125 U	0.137 U	0.15 U
1,2,3,7,8-PeCDD	UG/KG	0.704 U	0.697 U	0.768 U	0.841 U
1,2,3,4,7,8-HxCDD	UG/KG	0.49 U	0.486 U	0.535 U	0.586 U
1,2,3,6,7,8-HxCDD	UG/KG	0.44 U	0.436 U	0.48 U	0.526 U
1,2,3,7,8,9-HxCDD	UG/KG	0.377 U	0.374 U	0.411 U	0.451 U
1,2,3,4,6,7,8-HpCDD	UG/KG	4.86	5.15	1.34	0.901 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	19.8	23.2	4.61	1.39
2,3,7,8-TCDF	UG/KG	3.09	3.33	0.673	0.12 U
1,2,3,7,8-PeCDF	UG/KG	0.684	0.913	0.589	0.616 U
2,3,4,7,8-PeCDF	UG/KG	1.59	1.81	1.28	0.586 U
1,2,3,4,7,8-HxCDF	UG/KG	19.2	25.3	0.685 U	0.751 U
1,2,3,6,7,8-HxCDF	UG/KG	2.39	3.44	2.83	0.706 U
2,3,4,6,7,8-HxCDF	UG/KG	0.679	0.978	0.866	0.541 U
1,2,3,7,8,9-HxCDF	UG/KG	0.276 U	0.274 U	0.302 U	0.33
1,2,3,4,6,7,8-HpCDF	UG/KG	62.4	83.9	142	14.5
1,2,3,4,7,8,9-HpCDF	UG/KG	0.824	1.17	1.47	0.481 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	45.3	52.3	173	16.9
TOTAL TCDD	UG/KG	0.407	0.362	0.137 U	0.15 U
TOTAL PeCDD	UG/KG	0.704 U	0.697 U	0.768 U	0.841 U
TOTAL HxCDD	UG/KG	2.52	2.99	3.52	1.86
TOTAL HpCDD	UG/KG	8.93	9.74	3	0.901 U
TOTAL TCDF	UG/KG	17.4	18.6	8.42	0.947
TOTAL PeCDF	UG/KG	19.2	24.6	39.6	3.6
TOTAL HxCDF	UG/KG	40.6	52.6	29	5.62
TOTAL HpCDF	UG/KG	64.7	87.2	146	14.5
<i>TOTAL TCDD Equivalents</i>	UG/KG	4.11	5.23	2.73	0.20

Table 3E (cont.)  
 Analytical Results - Dioxins/Dibenzofurans  
 Yard Area Soil Borings  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID Laboratory Sample Number Grid Location Sampling Date Sample Matrix Sample Depth (feet below ground surface)	YA-4(0-2) 70109012	YA-4(3-5) 70109013	YA-4(6-8) 70109016	YA-5(0-2) 70109017	YA-5(3-5) 70109018	YA-5(6-8) 70109019
PARAMETERS	UNITS					
DIOXINS/BENZODUFORANS						
2,3,7,8-TCDD	UG/KG	2.83 U	0.134 U	0.152 U	0.115 U	0.137 U
1,2,3,7,8-PeCDD	UG/KG	5.31 U	0.749 U	0.85 U	0.642 U	0.767 U
1,2,3,4,7,8-HxCDD	UG/KG	0.501	0.521 U	0.592 U	0.447 U	0.534 U
1,2,3,6,7,8-HxCDD	UG/KG	0.386 U	0.468 U	0.531 U	0.401 U	0.479 U
1,2,3,7,8,9-HxCDD	UG/KG	0.403	0.401 U	0.455 U	0.344 U	0.411 U
1,2,3,4,6,7,8-HpCDD	UG/KG	0.662 U	1.62	0.911 U	0.934	0.821 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	6.18	20.6	1.09 U	6.05	0.986 U
2,3,7,8-TCDF	UG/KG	903	32.2	3.93	2.86	0.11 U
1,2,3,7,8-PeCDF	UG/KG	48.5	1.78	0.622 U	0.47 U	0.561 U
2,3,4,7,8-PeCDF	UG/KG	107	6.21	0.592 U	0.695	0.534 U
1,2,3,4,7,8-HxCDF	UG/KG	595	18.5	2.04	4.03	0.685 U
1,2,3,6,7,8-HxCDF	UG/KG	25	0.801	0.713 U	0.539 U	0.643 U
2,3,4,6,7,8-HxCDF	UG/KG	33.9	1.64	0.546 U	0.413 U	0.493 U
1,2,3,7,8,9-HxCDF	UG/KG	4.73 U	0.294 U	0.334 U	0.252 U	0.301 U
1,2,3,4,6,7,8-HpCDF	UG/KG	53.9	5.53	0.953	12.2	0.493 U
1,2,3,4,7,8,9-HpCDF	UG/KG	2.26	0.428 U	0.486 U	0.367 U	0.438 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	12.5	3.59	0.911 U	7.46	0.821 U
TOTAL TCDD	UG/KG	2.83 U	0.134 U	0.152 U	0.115 U	0.137 U
TOTAL PeCDD	UG/KG	5.31 U	0.749 U	0.85 U	0.642 U	0.767 U
TOTAL HxCDD	UG/KG	3.5	0.401 U	0.455 U	0.344 U	0.411 U
TOTAL HpCDD	UG/KG	1.89	3.4	0.911 U	1.88	0.821 U
TOTAL TCDF	UG/KG	4260	180	16.5	15.1	0.11 U
TOTAL PeCDF	UG/KG	1780	77.9	5.91	9.02	0.534 U
TOTAL HxCDF	UG/KG	871	29.2	2.59	7.67	0.301 U
TOTAL HpCDF	UG/KG	67	5.53	0.953	12.2	0.438 U
<i>TOTAL TCDD Equivalents</i>	UG/KG	212.29	8.60	0.61	1.18	0
						0

**TABLE 4**  
**YARD AREA SURFACE SOIL SAMPLES**

**Table 4A**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-6(0-2)	YA-7(0-2)	YA-8(0-2)	YA-9(0-2)	YA-10(0-2)	YA-11(0-2)
Laboratory Sample Number		70141052	70141054	70141051	70141049	70141032	70141060
Grid Location		A-2	A-4	A-6	A-8	A-10	A-12
Sampling Date		01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	810 U	810 U	40 U	800 U	830 U	220 U
Aroclor-1221	UG/KG	810 U	810 U	40 U	800 U	830 U	220 U
Aroclor-1232	UG/KG	810 U	810 U	40 U	800 U	830 U	220 U
Aroclor-1242	UG/KG	810 U	810 U	40 U	800 U	830 U	220 U
Aroclor-1248	UG/KG	810 U	6200	860	17000	6600	1100
Aroclor-1254	UG/KG	810 U	810 U	40 U	800 U	830 U	220 U
Aroclor-1260	UG/KG	14000	7800	620	7900	7400	1400
METALS							
Lead	MG/KG	2510	4280	1030	1410	14000	1120

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-12(0-2)	YA-13(0-2)	BBD-D3	YA-14(0-2)	YA-15(0-2)	YA-16(0-2)
Laboratory Sample Number	70141033	70141034	70141028	70141065	70141055	70141050
Grid Location	A-15	A-16	A-16	A-18	C-3	C-7
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(YA-13(0-2))	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS					
PCB's						
Aroclor-1016	UG/KG	400 U	850 U	820 U	150 U	200 U
Aroclor-1221	UG/KG	400 U	850 U	820 U	150 U	200 U
Aroclor-1232	UG/KG	400 U	850 U	820 U	150 U	200 U
Aroclor-1242	UG/KG	400 U	850 U	820 U	150 U	200 U
Aroclor-1248	UG/KG	3300	12000	8300	820	1000
Aroclor-1254	UG/KG	400 U	850 U	820 U	150 U	200 U
Aroclor-1260	UG/KG	1600	7600	7400	1900	1400
METALS						
Lead	MG/KG	4090	5230	3920	1520	4580
						2670

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-17(0-2) 70141053	YA-18(0-2) 70141057	YA-19(0-2) 70141038	YA-20(0-2) 70141056	YA-21(0-2) 70141040	YA-22(0-2) 70141058
Laboratory Sample Number		C-9	C-11	C-15	D-3	D-11	E-4
Grid Location		01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sampling Date		Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (0-2)
Sample Matrix							
Sample Depth (feet below ground surface)							
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	820 U	900 U	780 U	390 U	440 U	4000 U
Aroclor-1221	UG/KG	820 U	900 U	780 U	390 U	440 U	4000 U
Aroclor-1232	UG/KG	820 U	900 U	780 U	390 U	440 U	4000 U
Aroclor-1242	UG/KG	820 U	900 U	780 U	390 U	440 U	4000 U
Aroclor-1248	UG/KG	6700	7300	3300	390 U	440 U	6000
Aroclor-1254	UG/KG	820 U	900 U	780 U	390 U	440 U	4000 U
Aroclor-1260	UG/KG	1400	3100	2300	2500	1400	15000
METALS							
Lead	MG/KG	532.	2350	2100	198000	1680	901.

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-23(0-2)	YA-24(0-2)	YA-25(0-2)	YA-26(0-2)	YA-27(0-2)	YA-28(0-2)
Laboratory Sample Number		70141059	70141041	70141043	70141064	70141061	70141031
Grid Location		E-6	E-8	E-10	E-15	E-17	E-3
Sampling Date		01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	840 U	900 U	460 U	770 U	410 U	840 U
Aroclor-1221	UG/KG	840 U	900 U	460 U	770 U	410 U	840 U
Aroclor-1232	UG/KG	840 U	900 U	460 U	770 U	410 U	840 U
Aroclor-1242	UG/KG	840 U	900 U	460 U	770 U	410 U	840 U
Aroclor-1248	UG/KG	19000	3700	2600	1800	5000	840 U
Aroclor-1254	UG/KG	840 U	900 U	460 U	770 U	410 U	840 U
Aroclor-1260	UG/KG	3500	1200	1800	2300	1400	11,000
METALS							
Lead	MG/KG	3370	237.	1910	563.	1350	3120

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-29(0-2)	YA-29(0-2)DL	YA-30(0-2)	YA-31(0-2)	YA-32(0-2)	YA-32(0-2)DL
Laboratory Sample Number	70141035	70141035DL	70141044	70141039	70141045	70141045	70141045DL
Grid Location	F-6	F-6	F-12	G-4	G-10	G-10	G-10
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	900 U	9000 U	38 U	740 U	430 U	2100 U
Aroclor-1221	UG/KG	900 U	9000 U	38 U	740 U	430 U	2100 U
Aroclor-1232	UG/KG	900 U	9000 U	38 U	740 U	430 U	2100 U
Aroclor-1242	UG/KG	900 U	9000 U	38 U	740 U	430 U	2100 U
Aroclor-1248	UG/KG	9200	14000 D	260	2700	5500	5100 D
Aroclor-1254	UG/KG	900 U	9000 U	38 U	740 U	430 U	2100 U
Aroclor-1260	UG/KG	41,000 E	52,000 D	390	4300	22,000 E	29,000 D
METALS							
Lead	MG/KG	9350		455.	3230	10700	

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-33(0-2)	YA-34(0-2)	YA-35(0-2)	YA-36(0-2)	YA-37(0-2)
Laboratory Sample Number	70141047	70141062	70141048	70141063	70141001
Grid Location	G-14	G-16	G-18	H-18	H-8
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/09/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
<b>PARAMETERS</b>	<b>UNITS</b>				
PCB's					
Aroclor-1016	UG/KG	770 U	830 U	200 U	780 U
Aroclor-1221	UG/KG	770 U	830 U	200 U	780 U
Aroclor-1232	UG/KG	770 U	830 U	200 U	780 U
Aroclor-1242	UG/KG	770 U	830 U	200 U	780 U
Aroclor-1248	UG/KG	9800	5400	1800	6100
Aroclor-1254	UG/KG	770 U	830 U	200 U	780 U
Aroclor-1260	UG/KG	4000	2200	670	4300
METALS					
Lead	MG/KG	1620	1520	1450	1450
					5680

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID Laboratory Sample Number		YA-38(0-2) 70141016	YA-39(0-2) 70141018	YA-40(0-2) 70141020	YA-40(0-2)DL 70141020DL	YA-41(0-2) 70141042	YA-42(0-2) 70141046
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	3900 U	4200 U	20000 U	200000 U	780 U	440 U
Aroclor-1221	UG/KG	3900 U	4200 U	20000 U	200000 U	780 U	440 U
Aroclor-1232	UG/KG	3900 U	4200 U	20000 U	200000 U	780 U	440 U
Aroclor-1242	UG/KG	3900 U	4200 U	20000 U	200000 U	780 U	440 U
Aroclor-1248	UG/KG	13000	160000	1200000 E	1600000 D	5800	6600
Aroclor-1254	UG/KG	3900 U	4200 U	20000 U	200000 U	780 U	440 U
Aroclor-1260	UG/KG	5500	22000	71000	200000 U	17000	13000
METALS							
Lead	MG/KG	2890	2100	7870		8730	1860

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-43(0-2)	YA-43(0-2)DL	YA-44(0-2)	YA-45(0-2)	YA-46(0-2)	YA-47(0-2)
Laboratory Sample Number		70141019	70141019DL	70141002	70141003	70141017	70141021
Grid Location		I-15	I-15	I-17	I-19	J-6	K-8
Sampling Date		01/08/97	01/08/97	01/09/97	01/09/97	01/08/97	01/08/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS						
PCB's							
Aroclor-1016	UG/KG	390 U	2000 U	42 U	41 U	350 U	720 U
Aroclor-1221	UG/KG	390 U	2000 U	42 U	41 U	350 U	720 U
Aroclor-1232	UG/KG	390 U	2000 U	42 U	41 U	350 U	720 U
Aroclor-1242	UG/KG	390 U	2000 U	42 U	41 U	350 U	720 U
Aroclor-1248	UG/KG	24000 E	30000 D	340	1100	2800	14000
Aroclor-1254	UG/KG	390 U	2000 U	42 U	41 U	350 U	720 U
Aroclor-1260	UG/KG	6200	7900 D	600	470	970	900
METALS							
Lead	MG/KG	2160		1270	1440	143.	141.

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-48(0-2)	YA-48(0-2)DL	YA-49(0-2)	YA-50(0-2)	YA-51(0-2)
Laboratory Sample Number	70141027	70141027DL	70141004	70141005	70141006
Grid Location	K-I2	K-12	K-14	K-16	K-20
Sampling Date	01/08/97	01/08/97	01/09/97	01/09/97	01/09/97
Sample Matrix	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (0-2)
Sample Depth (feet below ground surface)					
PARAMETERS	UNITS				
PCB's					
Aroclor-1016	UG/KG	780 U	9700 U	1100 U	1100 U
Aroclor-1221	UG/KG	780 U	9700 U	1100 U	1100 U
Aroclor-1232	UG/KG	780 U	9700 U	1100 U	1100 U
Aroclor-1242	UG/KG	780 U	9700 U	1100 U	1100 U
Aroclor-1248	UG/KG	84000 E	140000 D	2200	1100 U
Aroclor-1254	UG/KG	780 U	9700 U	1100 U	1100 U
Aroclor-1260	UG/KG	25000	30000 D	3900	5300
METALS					
Lead	MG/KG	3320		4650	2470
					1380

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-52(0-2)	YA-52(0-2)DL	YA-53(0-2)	YA-53(0-2)DL	YA-54(0-2)	YA-55(0-2)	YA-55(0-2)DL
Laboratory Sample Number	70141022	70141022DL	70141025	70141025DL	70141007	70141008	70141008	70141008DL
Grid Location	L-9	L-9	L-12	L-12	L-16	L-18	L-18	L-18
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/09/97	01/09/97	01/09/97	01/09/97
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS							
PCB's								
Aroclor-1016	UG/KG	720 U	7200 U	40000 U	200000 U	810 U	760 U	7600 U
Aroclor-1221	UG/KG	720 U	7200 U	40000 U	200000 U	810 U	760 U	7600 U
Aroclor-1232	UG/KG	720 U	7200 U	40000 U	200000 U	810 U	760 U	7600 U
Aroclor-1242	UG/KG	720 U	7200 U	40000 U	200000 U	810 U	760 U	7600 U
Aroclor-1248	UG/KG	51000 E	68000 D	1800000 E	3400000 D	16000	57000 E	74000 D
Aroclor-1254	UG/KG	720 U	7200 U	40000 U	200000 U	810 U	760 U	7600 U
Aroclor-1260	UG/KG	4000	3700 JD	87000	120000 JD	7100	8900	9100 D
METALS								
Lead	MG/KG	515.		6480		6330	3330	

**Table 4A (cont.)**  
**Analytical Results - PCBs and Lead**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-56(0-2)	BBD-D4	YA-57(0-2)	BBD-D5	YA-58(0-2)
Laboratory Sample Number	70141026	70141029	70141009	70141013	70141010
Grid Location	M-11	M-11	M-13	M-13	M-15
Sampling Date	01/08/97	01/08/97	01/09/97	01/09/97	01/09/97
Sample Matrix	Soil (0-2)	Soil (YA-56(0-2))	Soil (0-2)	Soil (YA-57(0-2))	Soil (0-2)
Sample Depth (feet below ground surface)					
PARAMETERS	UNITS				
PCB's					
Aroclor-1016	UG/KG	750 U	750 U	740 U	1800 U
Aroclor-1221	UG/KG	750 U	750 U	740 U	1800 U
Aroclor-1232	UG/KG	750 U	750 U	740 U	1800 U
Aroclor-1242	UG/KG	750 U	750 U	740 U	1800 U
Aroclor-1248	UG/KG	30000	30000	25000	38000
Aroclor-1254	UG/KG	750 U	750 U	740 U	1800 U
Aroclor-1260	UG/KG	2400	2500	3200	5100
METALS					
Lead	MG/KG	116.	231.	597.	340.
					1110

**Table 4B**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-6(0-2)	YA-7(0-2)	YA-8(0-2)	YA-9(0-2)	YA-10(0-2)	YA-11(0-2)	YA-12(0-2)	
Laboratory Sample Number	70141052	70141054	70141051	70141049	70141032	70141060	70141033	
Grid Location	A-2	A-4	A-6	A-8	A-10	A-12	A-14	
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	
Sample Matrix	Soil (0-2)							
Sample Depth (feet below ground surface)								
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	0.12 U	0.133	0.119 U	1.29 U	0.704 U	0.135 U	0.124 U
1,2,3,7,8-PeCDD	UG/KG	1.6 U	22.2 U	0.666 U	1.78 U	1.23 U	0.758 U	0.695 U
1,2,3,4,7,8-HxCDD	UG/KG	0.466 U	0.488 U	0.464 U	3.09 U	1.9 U	0.528 U	0.484 U
1,2,3,6,7,8-HxCDD	UG/KG	0.418 U	0.463	0.417 U	2.57 U	1.53 U	0.474 U	0.435 U
1,2,3,7,8,9-HxCDD	UG/KG	0.359 U	0.376 U	0.357 U	2.65 U	1.63 U	0.406 U	0.372 U
1,2,3,4,6,7,8-HpCDD	UG/KG	2.17	2.81	0.714 U	2.44	1.91	0.812 U	0.745 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	9.28	9.65	1.31	3.95 U	24.2	1.36	1.51
2,3,7,8-TCDF	UG/KG	1.74	5.94	1.75	119	9.94	0.108 U	4.34
1,2,3,7,8-PeCDF	UG/KG	1.06	4.75	0.488 U	4.64	7.21	1.64	0.621
2,3,4,7,8-PeCDF	UG/KG	0.466 U	8.62	0.464 U	17.9	7.55	5.11	2.03
1,2,3,4,7,8-HxCDF	UG/KG	0.598 U	57.4	1.75	81.4	373	2.38	5.71
1,2,3,6,7,8-HxCDF	UG/KG	6.34	9.92	0.559 U	3.4	50.6	0.636 U	0.584 U
2,3,4,6,7,8-HxCDF	UG/KG	0.865	1.88	0.428 U	1.42 U	6.3	0.487 U	0.447 U
1,2,3,7,8,9-HxCDF	UG/KG	0.263 U	0.275 U	0.262 U	1.53 U	1.39 U	0.298 U	0.273 U
1,2,3,4,6,7,8-HpCDF	UG/KG	373	307	4.39	108	624	6.83	5.77
1,2,3,4,7,8,9-HpCDF	UG/KG	2.1	3.52	0.381 U	1.51	7.53	0.433 U	0.397 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	551	275	3.58	2.64 U	721	4.68	6.59
TOTAL TCDD	UG/KG	0.216	0.671	0.119 U	1.29 U	1.7	0.135 U	0.124 U
TOTAL PeCDD	UG/KG	1.6 U	22.2 U	0.666 U	1.78 U	2.84	0.758 U	0.695 U
TOTAL HxCDD	UG/KG	1.67	4.06	0.357 U	2.57 U	4.83	0.406 U	0.372 U
TOTAL HpCDD	UG/KG	3.15	4.33	0.714 U	2.44	1.91	0.812 U	0.745 U
TOTAL TCDF	UG/KG	8.74	20.1	7.31	587	80.8	0.108 U	19.4
TOTAL PeCDF	UG/KG	24.1	113	3.25	290	155	51.5	22
TOTAL HxCDF	UG/KG	41.1	122	2.73	117	770	3.93	8.5
TOTAL HpCDF	UG/KG	381	317	4.39	110	784	6.83	5.77
<b>TOTAL TCDD Equivalents</b>	UG/KG	<b>5.28</b>	<b>15.66</b>	<b>0.40</b>	<b>30.68</b>	<b>55.20</b>	<b>2.95</b>	<b>2.12</b>

**Table 4B (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID	YA-13(0-2)	BBD-D3	YA-14(0-2)	YA-15(0-2)	YA-16(0-2)	YA-17(0-2)	YA-18(0-2)	
Laboratory Sample Number	70141034	70141028	70141065	70141055	70141050	70141053	70141057	
Grid Location	A-16	A-16	A-18	C-3	C-7	C-9	C-11	
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Depth (feet below ground surface)	(0-2)	(YA-13(0-2))	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	0.102 U	0.128 U	0.115 U	0.13 U	0.0969 U	0.118 U	0.134 U
1,2,3,7,8-PeCDD	UG/KG	0.931 U	0.718 U	0.645 U	2.62 U	0.885 U	0.662 U	0.753 U
1,2,3,4,7,8-HxCDD	UG/KG	0.319 U	0.5 U	0.449 U	0.505 U	0.303 U	0.461 U	0.524 U
1,2,3,6,7,8-HxCDD	UG/KG	0.472 U	0.449 U	0.403 U	0.453 U	0.448 U	0.414 U	0.471 U
1,2,3,7,8,9-HxCDD	UG/KG	0.344 U	0.385 U	0.346 U	0.389 U	0.327 U	0.355 U	0.403 U
1,2,3,4,6,7,8-HpCDD	UG/KG	4.11	1.8	0.727	1.63	2.06	0.71 U	1.39
1,2,3,4,6,7,8,9-OCDD	UG/KG	17.9	11.8	5.04	6.25	20.9	0.861	9.29
2,3,7,8-TCDF	UG/KG	10.9	16.3	2.04	1.22	6.58	2.87	5.09
1,2,3,7,8-PeCDF	UG/KG	0.485 U	1.26	0.472 U	1.12	0.46 U	0.485 U	0.551 U
2,3,4,7,8-PeCDF	UG/KG	3.62	3.77	0.837	1.77	1.6	0.538	0.872
1,2,3,4,7,8-HxCDF	UG/KG	30.7	52.2	12.5	32.1	7.79	3.16	12.3
1,2,3,6,7,8-HxCDF	UG/KG	5.4	6.08	1.86	5.16	1.11 U	0.556 U	1.68
2,3,4,6,7,8-HxCDF	UG/KG	0.868 U	1.52	0.415 U	0.861	0.824 U	0.426 U	0.484 U
1,2,3,7,8,9-HxCDF	UG/KG	0.931 U	0.663	0.253 U	0.285 U	0.885 U	0.26 U	0.296 U
1,2,3,4,6,7,8-HpCDF	UG/KG	151	151	53.3	277	23.4	4.92	36.1
1,2,3,4,7,8,9-HpCDF	UG/KG	2.33	1.79	0.857	8.04 U	0.618 U	0.379 U	0.59
1,2,3,4,6,7,8,9-OCDF	UG/KG	525	683	57.4	280	19.8	2.78	29.7
TOTAL TCDD	UG/KG	0.152	0.254	0.115 U	36.2	48.3	0.118 U	0.134 U
TOTAL PeCDD	UG/KG	1.15	0.718 U	0.645 U	2.62 U	0.885 U	0.662 U	0.753 U
TOTAL HxCDD	UG/KG	1.96	3.83	0.346 U	0.94	1.1	0.355 U	0.403 U
TOTAL HpCDD	UG/KG	4.11	1.8	0.727	1.63	4.06	0.71 U	2.26
TOTAL TCDF	UG/KG	54.5	82.8	12.3	6.52	29.9	8.66	26.6
TOTAL PeCDF	UG/KG	43.8	52.4	23.5	24	18.1	3.83	5.94
TOTAL HxCDF	UG/KG	74	110	26.9	67.9	14.5	3.71	23.1
TOTAL HpCDF	UG/KG	170	156	56.2	280	24.9	5.33	37.9
<i>TOTAL TCDD Equivalents</i>	UG/KG	8.63	11.87	2.67	7.95	2.53	0.92	2.76

**Table 4B (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-19(0-2)	YA-20(0-2)	YA-21(0-2)	YA-22(0-2)	YA-23(0-2)	YA-24(0-2)	YA-25(0-2)
Laboratory Sample Number		70141038	70141056	70141040	70141058	70141059	70141041	70141043
Grid Location		C-15	D-3	D-11	E-4	E-6	E-8	E-10
Sampling Date		01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97
Sample Matrix		Soil						
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	1.77 U	0.516 U	0.103 U	1.68 U	0.124 U	0.0994 U	0.108 U
1,2,3,7,8-PeCDD	UG/KG	2.45 U	0.708 U	0.94 U	3.13 U	0.693 U	0.907 U	0.984 U
1,2,3,4,7,8-HxCDD	UG/KG	5.11 U	0.487 U	0.322 U	2.85 U	0.483 U	0.311 U	0.337 U
1,2,3,6,7,8-HxCDD	UG/KG	4.21 U	0.481	0.476 U	2.31 U	0.433 U	0.46 U	0.499 U
1,2,3,7,8,9-HxCDD	UG/KG	4.35 U	0.375 U	0.348 U	2.39 U	0.371 U	0.336 U	0.364 U
1,2,3,4,6,7,8-HpCDD	UG/KG	6.77 U	3.22	1.03 U	4.04 U	2.34	0.994 U	1.08 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	6.44	7.81	1.37	15.2	7.59	0.98	4.36
2,3,7,8-TCDF	UG/KG	4.57	3.65	0.127	13.3	29.3	0.087 U	3.5
1,2,3,7,8-PeCDF	UG/KG	1.4 U	2.55	0.489 U	1.15 U	2.94	0.472 U	0.512 U
2,3,4,7,8-PeCDF	UG/KG	1.13 U	4.69	0.824 U	1.14 U	7.54	0.796 U	0.863 U
1,2,3,4,7,8-HxCDF	UG/KG	8.77	68.2	2.09	2460	29.5	1.63	2.9
1,2,3,6,7,8-HxCDF	UG/KG	1.18 U	11.1	1.18 U	297	3.09	1.14 U	1.24 U
2,3,4,6,7,8-HxCDF	UG/KG	1.63 U	1.87	0.875 U	0.604 U	1.99	0.845 U	0.917 U
1,2,3,7,8,9-HxCDF	UG/KG	1.82 U	0.275 U	0.94 U	0.671 U	0.272 U	0.907 U	0.984 U
1,2,3,4,6,7,8-HpCDF	UG/KG	33.9	428	7.83	22100	57.1	3.57	6.62
1,2,3,4,7,8,9-HpCDF	UG/KG	2.39 U	6.13	0.657 U	34.6	1	0.634 U	0.688 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	14.3	701	5.04	44200	46.8	0.808 U	5.94
TOTAL TCDD	UG/KG	1.77 U	0.669	0.103 U	1.68 U	0.124 U	0.0994 U	20.2
TOTAL PeCDD	UG/KG	2.45 U	12.5	0.94 U	3.13 U	0.693 U	0.907 U	0.984 U
TOTAL HxCDD	UG/KG	4.21 U	2.9	0.322 U	2.31 U	1.33	0.311 U	0.337 U
TOTAL HpCDD	UG/KG	6.77 U	4.79	1.03 U	4.04 U	4	0.994 U	1.08 U
TOTAL TCDF	UG/KG	12.2	19.6	0.399	23.3	130	2.06	15.2
TOTAL PeCDF	UG/KG	9.49	57.4	0.539	689	101	2.38	6.92
TOTAL HxCDF	UG/KG	8.77	144	3.94	5520	54	1.63	4.71
TOTAL HpCDF	UG/KG	37.4	525	9.33	25300	60	3.57	6.62
<i>TOTAL TCDD Equivalents</i>	UG/KG	1.69	16.08	0.31	542.59	10.96	0.20	0.72

Table 4B (cont.)  
 Analytical Results - Dioxins/Dibenzofurans  
 Yard Area Surface Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID		YA-26(0-2)	YA-27(0-2)	YA-28(0-2)	YA-29(0-2)	YA-30(0-2)	YA-31(0-2)	YA-32(0-2)
Laboratory Sample Number	70141064	70141061	70141031	70141035	70141044	70141039	70141045	
Grid Location	E-15	E-17	F-3	F-6	F-12	G-4	G-10	
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	01/08/97	
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	0.114 U	0.12 U	0.129 U	1.78 U	0.091 U	1.63 U	0.1 U
1,2,3,7,8-PeCDD	UG/KG	0.636 U	0.673 U	0.72 U	2.46 U	0.83 U	2.26 U	1.49
1,2,3,4,7,8-HxCDD	UG/KG	0.443 U	0.469 U	0.502 U	3.55 U	0.284 U	2.87 U	0.313 U
1,2,3,6,7,8-HxCDD	UG/KG	0.398 U	0.421 U	0.45 U	2.92 U	0.421 U	2.36 U	0.463 U
1,2,3,7,8,9-HxCDD	UG/KG	0.341 U	0.361 U	0.386 U	3.02 U	0.307 U	2.44 U	0.338 U
1,2,3,4,6,7,8-HpCDD	UG/KG	0.682 U	0.721 U	0.898	4.7 U	0.91 U	3.8 U	1 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	3.19	3.53	20.7	15.6	0.989	30.3	3.51
2,3,7,8-TCDF	UG/KG	0.459	8.2	0.7	20.8	0.0796 U	0.853 U	0.0875 U
1,2,3,7,8-PeCDF	UG/KG	0.466 U	0.493 U	0.527 U	1.26 U	0.432 U	1.01 U	1.36
2,3,4,7,8-PeCDF	UG/KG	0.443 U	0.469 U	0.502 U	6.26	0.728 U	0.814 U	2
1,2,3,4,7,8-HxCDF	UG/KG	0.568 U	4.33	2.65	1.61 U	1.04 U	8.92	5.11
1,2,3,6,7,8-HxCDF	UG/KG	0.534 U	0.565 U	3.01	5.81	1.05 U	0.678 U	1.15 U
2,3,4,6,7,8-HxCDF	UG/KG	0.409 U	0.433 U	0.982	3.24	0.774 U	0.933 U	0.85 U
1,2,3,7,8,9-HxCDF	UG/KG	0.25 U	0.264 U	1.3	1.47	0.83 U	1.05 U	0.913 U
1,2,3,4,6,7,8-HpCDF	UG/KG	7.32	4.17	67.7	177	3.97	70.2	7.73
1,2,3,4,7,8,9-HpCDF	UG/KG	0.364 U	0.385 U	0.625	1.92	0.58 U	1.21	0.638 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	5.44	3.47	119	256	1.85 U	123	32.4
TOTAL TCDD	UG/KG	0.114 U	0.12 U	0.129 U	8.54	0.091 U	1.63 U	21.2
TOTAL PeCDD	UG/KG	0.636 U	0.673 U	0.72 U	4.6	0.83 U	2.26 U	1.49
TOTAL HxCDD	UG/KG	0.341 U	0.361 U	1.68	20.5	0.284 U	2.36 U	0.313 U
TOTAL HpCDD	UG/KG	0.682 U	0.721 U	0.898	2.52	0.91 U	3.8 U	1 U
TOTAL TCDF	UG/KG	1.68	38.4	3.06	173	0.0796 U	0.853 U	5.17
TOTAL PeCDF	UG/KG	2.84	5.61	5.9	126	0.432 U	2.25	13.2
TOTAL HxCDF	UG/KG	2.65	6.27	28.1	86.3	0.774 U	15.8	8.89
TOTAL HpCDF	UG/KG	8.91	4.17	80.4	196	3.97	71.4	8.53
<i>TOTAL TCDD Equivalents</i>	UG/KG	0.128	1.302	1.70	8.32	0.04	1.76	2.44

Table 4B (cont.)

Analytical Results - Dioxins/Dibenzofurans  
 Yard Area Surface Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Blasland, Bouck & Lee Sample ID		YA-33(0-2)	YA-34(0-2)	YA-35(0-2)	YA-36(0-2)	YA-37(0-2)	YA-38(0-2)	YA-39(0-2)
Laboratory Sample Number		70141047	70141062	70141048	70141063	70141001	70141016	70141018
Grid Location		G-14	G-16	G-18	H-18	H-8	I-5	I-7
Sampling Date		01/08/97	01/08/97	01/08/97	01/08/97	01/09/97	01/08/97	01/08/97
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Depth (feet below ground surface)		(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	0.0933 U	0.122 U	0.0929 U	0.117 U	0.114 U	0.209	0.515 U
1,2,3,7,8-PeCDD	UG/KG	0.851 U	0.68 U	0.847 U	0.653 U	0.638 U	1.43	0.897 U
1,2,3,4,7,8-HxCDD	UG/KG	0.291 U	0.474 U	0.29 U	0.454 U	0.444 U	0.914	1.96 U
1,2,3,6,7,8-HxCDD	UG/KG	0.431 U	0.425 U	0.429 U	0.408 U	0.399 U	1.93	1.58 U
1,2,3,7,8,9-HxCDD	UG/KG	0.315 U	0.365 U	0.313 U	0.35 U	0.342 U	2.31	1.68 U
1,2,3,4,6,7,8-HpCDD	UG/KG	2.22	0.734	0.998	1.14	0.683 U	79	1.89
1,2,3,4,6,7,8,9-OCDD	UG/KG	10.2	6.54	11.3	10.1	2.94	696	6.98
2,3,7,8-TCDF	UG/KG	5.1	2.1	5.47	1.76	14.3	7.86	189
1,2,3,7,8-PeCDF	UG/KG	0.443 U	0.498 U	0.441 U	0.478 U	0.467 U	1.89	49.7
2,3,4,7,8-PeCDF	UG/KG	1.66	0.474 U	1.48	1.06	2.98	5.17	36.1
1,2,3,4,7,8-HxCDF	UG/KG	5.64	2.59	4.37	0.583 U	6.44	50.4	283
1,2,3,6,7,8-HxCDF	UG/KG	1.07 U	0.571 U	1.07 U	0.548 U	0.535 U	6.59	23.2
2,3,4,6,7,8-HxCDF	UG/KG	0.793 U	0.437 U	0.789 U	0.42 U	0.46	2.2	13.5
1,2,3,7,8,9-HxCDF	UG/KG	0.851 U	0.267 U	0.847 U	0.256 U	0.251 U	0.252 U	1.37 U
1,2,3,4,6,7,8-HpCDF	UG/KG	16.5	8.47	5.97	1.62	3.03	167	465
1,2,3,4,7,8,9-HpCDF	UG/KG	0.595 U	0.389 U	0.592 U	0.373 U	0.364 U	2.79	3.97
1,2,3,4,6,7,8,9-OCDF	UG/KG	40.1	5.76	4.66	1.06	1.94	130	2.22
TOTAL TCDD	UG/KG	28.9	0.122 U	12	0.117 U	0.114 U	4.71	0.515 U
TOTAL PeCDD	UG/KG	0.851 U	0.68 U	0.847 U	0.653 U	0.638 U	14	2.48
TOTAL HxCDD	UG/KG	0.582	0.365 U	0.557	0.355	0.342 U	25.8	1.07
TOTAL HpCDD	UG/KG	2.22	0.734	0.998	2.02	0.683 U	167	1.89
TOTAL TCDF	UG/KG	23.8	8.06	25.6	5.28	66.5	40	1010
TOTAL PeCDF	UG/KG	16.1	5.71	14.5	14.5	39.2	65.5	513
TOTAL HxCDF	UG/KG	10.6	4.41	7.22	0.943	9.52	108	558
TOTAL HpCDF	UG/KG	18.7	8.47	6.78	1.62	3.03	174	532
<i>TOTAL TCDD Equivalents</i>	UG/KG	2.14	0.57	1.81	0.74	3.65	14.14 <sup>2</sup>	76.12

**Table 4B (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-40(0-2)	YA-41(0-2)	YA-42(0-2)	YA-43(0-2)	YA-44(0-2)	YA-45(0-2)	YA-46(0-2)
Laboratory Sample Number	70141020	70141042	70141046	70141019	70141002	70141003	70141017	
Grid Location	I-9	I-11	I-13	I-15	I-17	I-19	J-6	
Sampling Date	01/08/97	01/08/97	01/08/97	01/08/97	01/09/97	01/09/97	01/08/97	
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Depth (feet below ground surface)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	(0-2)	
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	1.07 U	1.82 U	0.0759	0.113 U	0.13 U	0.118 U	0.0828 U
1,2,3,7,8-PeCDD	UG/KG	1.53 U	2.51 U	0.0791	0.634 U	0.726 U	0.663 U	0.756 U
1,2,3,4,7,8-HxCDD	UG/KG	1.18	0.874	0.232	0.442 U	0.505 U	0.462 U	0.259 U
1,2,3,6,7,8-HxCDD	UG/KG	1.42	3.22	0.291	0.396 U	0.453 U	0.414 U	0.383 U
1,2,3,7,8,9-HxCDD	UG/KG	2.49	3.15	0.314	0.34 U	0.389 U	0.355 U	0.28 U
1,2,3,4,6,7,8-HpCDD	UG/KG	11.5	79.8	3.49	1.85	1.22	0.711 U	0.828 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	11.2	280	14.3	13.8	8.24	1.75	11.7
2,3,7,8-TCDF	UG/KG	2930	14.8	4.44	5.05	0.104 U	0.0947 U	3.43
1,2,3,7,8-PeCDF	UG/KG	156	2.69	0.421	0.642	0.531 U	0.486 U	0.393 U
2,3,4,7,8-PeCDF	UG/KG	622	9.82	0.948	1.79	0.505 U	0.462 U	0.874
1,2,3,4,7,8-HxCDF	UG/KG	1150	95.2	7.88	5.74	0.648 U	0.592 U	3.67
1,2,3,6,7,8-HxCDF	UG/KG	51.9	18.5	1.7	0.655	0.609 U	0.557 U	0.953 U
2,3,4,6,7,8-HxCDF	UG/KG	99.7	4.31	0.885	0.408 U	0.466 U	0.426 U	0.704 U
1,2,3,7,8,9-HxCDF	UG/KG	0.949	2.13	0.0246 U	0.249 U	0.285 U	0.261 U	0.756 U
1,2,3,4,6,7,8-HpCDF	UG/KG	285	389	26.7	20.5	0.466 U	0.584	12.6
1,2,3,4,7,8,9-HpCDF	UG/KG	7.52	10.5	0.551	0.362 U	0.415 U	0.379 U	0.528 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	62.2	287	18.3	25.1	0.777 U	0.711 U	11.2
TOTAL TCDD	UG/KG	1.07 U	1.44	0.598	0.113 U	0.13 U	0.118 U	0.0828 U
TOTAL PeCDD	UG/KG	1.53 U	11.5	0.437	0.634 U	0.726 U	0.663 U	0.756 U
TOTAL HxCDD	UG/KG	17.3	32.1	3.62	0.34 U	0.389 U	0.355 U	0.259 U
TOTAL HpCDD	UG/KG	17.6	140	8.65	2.59	1.22	0.711 U	0.828 U
TOTAL TCDF	UG/KG	13400	71.2	21.9	22.2	0.104 U	0.0947 U	8.82
TOTAL PeCDF	UG/KG	6710	149	16.1	21.6	0.505 U	0.462 U	26.1
TOTAL HxCDF	UG/KG	1720	217	22.3	10.7	0.285 U	0.261 U	5.84
TOTAL HpCDF	UG/KG	303	488	29.5	21.2	0.415 U	0.584	13.1
<b>TOTAL TCDD Equivalents</b>	<b>UG/KG</b>	<b>745.68</b>	<b>24.62</b>	<b>2.52</b>	<b>2.33</b>	<b>0.02</b>	<b>0.008</b>	<b>1.30</b>

**Table 4B (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

**Table 4B (cont.)**  
**Analytical Results - Dioxins/Dibenzofurans**  
**Yard Area Surface Soil Samples**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		YA-54(0-2) 70141007	YA-55(0-2) 70141008	YA-56(0-2) 70141026	BBD-D4 70141029	YA-57(0-2) 70141009	BBD-D5 70141013	YA-58(0-2) 70141010
Laboratory Sample Number		L-16	L-18	M-11	M-11	M-13	M-13	M-15
Grid Location		01/09/97	01/09/97	01/08/97	01/08/97	01/09/97	01/09/97	01/09/97
Sampling Date		Soil (0-2)	Soil (0-2)	Soil (0-2)	Soil (YA-56(0-2))	Soil (0-2)	Soil (YA-57(0-2))	Soil (0-2)
PARAMETERS	UNITS							
DIOXINS/DIBENZOFURANS								
2,3,7,8-TCDD	UG/KG	0.116 U	0.116 U	0.111 U	0.112 U	0.109 U	0.109 U	0.11 U
1,2,3,7,8-PeCDD	UG/KG	0.649 U	0.649 U	0.622 U	0.629 U	0.61 U	0.611 U	0.617 U
1,2,3,4,7,8-HxCDD	UG/KG	0.452 U	0.452 U	0.433 U	0.438 U	0.425 U	0.426 U	0.43 U
1,2,3,6,7,8-HxCDD	UG/KG	0.474	0.405 U	0.388 U	0.393 U	0.381 U	0.382 U	0.386 U
1,2,3,7,8,9-HxCDD	UG/KG	0.655	0.347 U	0.333 U	0.337 U	0.327 U	0.327 U	0.331 U
1,2,3,4,6,7,8-HpCDD	UG/KG	18.7	14.1	0.666 U	0.674 U	0.826	0.662	5.72
1,2,3,4,6,7,8,9-OCDD	UG/KG	135	99.2	2.68	3.74	3.75	4.3	32.3
2,3,7,8-TCDF	UG/KG	4.47	19	33.8	42	28.8	34.4	30.5
1,2,3,7,8-PeCDF	UG/KG	0.804	1.79	5	2.32	2.66	1.97	2.53
2,3,4,7,8-PeCDF	UG/KG	2.23	6.95	13.1	7.68	9.72	6.99	8.25
1,2,3,4,7,8-HxCDF	UG/KG	9.91	11.3	17.3	61.9	18.4	19.1	16.1
1,2,3,6,7,8-HxCDF	UG/KG	1.47	0.804	1.07	3.43	1.22	1.3	1.26
2,3,4,6,7,8-HxCDF	UG/KG	0.704	1	0.686	4.81	1.45	1.83	1.49
1,2,3,7,8,9-HxCDF	UG/KG	0.255 U	0.255 U	0.337	1.16	0.337	0.24 U	0.242 U
1,2,3,4,6,7,8-HpCDF	UG/KG	36.2	17.3	10.5	15.9	21.4	22.4	33.2
1,2,3,4,7,8,9-HpCDF	UG/KG	0.71	0.371 U	0.355 U	0.36 U	0.349 U	0.349 U	0.533
1,2,3,4,6,7,8,9-OCDF	UG/KG	25	13.8	23.2	12.9	15.9	17.9	23.5
TOTAL TCDD	UG/KG	0.216	0.116 U	0.111 U	0.112 U	0.109 U	0.109 U	0.11 U
TOTAL PeCDD	UG/KG	1.58	0.805	0.622 U	0.629 U	0.61 U	0.611 U	0.617 U
TOTAL HxCDD	UG/KG	6.36	3.36	0.333 U	0.337 U	0.327 U	0.327 U	1.05
TOTAL HpCDD	UG/KG	44.4	35	0.666 U	0.674 U	0.826	0.662	9.95
TOTAL TCDF	UG/KG	22.5	83.6	160	199	137	166	131
TOTAL PeCDF	UG/KG	28.2	80.1	158	101	111	84.1	108
TOTAL HxCDF	UG/KG	23.3	19.2	26.2	99.2	30.5	31.4	28.7
TOTAL HpCDF	UG/KG	38	22.1	10.8	18	21.8	22.8	34.4
<b>TOTAL TCDD Equivalents</b>	<b>UG/KG</b>	<b>3.64</b>	<b>7.20</b>	<b>12.25</b>	<b>15.46</b>	<b>10.26</b>	<b>9.51</b>	<b>9.64</b>

**TABLE 5**  
**RINSE BLANKS**

**Table 5A**  
**Analytical Results - Rinse Blanks**  
**Bayonne Barrel and Drum Site**  
**Newark, New Jersey**

Blasland, Bouck & Lee Sample ID		BBD-RB-2	BBD-RB-1
Laboratory Sample Number		70141014	70141030
Sampling Date		01/09/97	01/08/97
Sample Matrix		Aqueous	Aqueous
<b>PARAMETERS</b>		<b>UNITS</b>	
<b>METALS</b>			
Lead	MG/KG	1.86 U	1.86 U
<b>PCB's</b>			
Aroclor-1016	UG/KG	0.20 U	0.20 U
Aroclor-1221	UG/KG	0.20 U	0.20 U
Aroclor-1232	UG/KG	0.20 U	0.20 U
Aroclor-1242	UG/KG	0.20 U	0.20 U
Aroclor-1248	UG/KG	0.20 U	0.20 U
Aroclor-1254	UG/KG	0.20 U	0.20 U
Aroclor-1260	UG/KG	0.20 U	0.20 U
<b>DIOXINS/DIBENZOFURANS</b>			
2,3,7,8-TCDD	UG/KG	0.32 U	0.32 U
1,2,3,7,8-PeCDD	UG/KG	6.4 U	6.4 U
1,2,3,4,7,8-HxCDD	UG/KG	4 U	4 U
1,2,3,6,7,8-HxCDD	UG/KG	1.4 U	1.4 U
1,2,3,7,8,9-HxCDD	UG/KG	2 U	2 U
1,2,3,4,6,7,8-HpCDD	UG/KG	4.1 U	4.1 U
1,2,3,4,6,7,8,9-OCDD	UG/KG	4.4 U	4.4 U
2,3,7,8-TCDF	UG/KG	0.36 U	0.36 U
1,2,3,7,8-PeCDF	UG/KG	5.6 U	5.6 U
2,3,4,7,8-PeCDF	UG/KG	8 U	8 U
1,2,3,4,7,8-HxCDF	UG/KG	7 U	7 U
1,2,3,6,7,8-HxCDF	UG/KG	6.5 U	6.5 U
2,3,4,6,7,8-HxCDF	UG/KG	4.2 U	4.2 U
1,2,3,7,8,9-HxCDF	UG/KG	3.8 U	3.8 U
1,2,3,4,6,7,8-HpCDF	UG/KG	1.4 U	1.4 U
1,2,3,4,7,8,9-HpCDF	UG/KG	4.3 U	4.3 U
1,2,3,4,6,7,8,9-OCDF	UG/KG	2.5 U	2.5 U
TOTAL TCDD	UG/KG	0.32 U	0.32 U
TOTAL PeCDD	UG/KG	6.4 U	6.4 U
TOTAL HxCDD	UG/KG	2.47 U	2.47 U
TOTAL HpCDD	UG/KG	4.1 U	4.1 U
TOTAL TCDF	UG/KG	0.36 U	0.36 U
TOTAL PeCDF	UG/KG	6.8 U	6.8 U
TOTAL HxCDF	UG/KG	5.38 U	5.38 U
TOTAL HpCDF	UG/KG	2.85 U	2.85 U

**ATTACHMENTS**

**ATTACHMENT 1**  
**SUMMARY OF SAMPLE DESCRIPTIONS AND FIELD OBSERVATIONS**

Attachment 1  
 Summary of Sample Descriptions and Field Observations  
 Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Sample #	Sample Depth (feet bgs)	PID (ppm)	Sample Description
<i>Furnace Courtyard Area</i>			
FCA-1	0-2	100	No sample description listed in field notes
FCA-2	0-2	250	Dark brown to black silt (0-1.8); Black fine to medium sandy cinders, organic odor (1.8-2.0)
	2-4	50	Wet, brown, fine to coarse sand, some small pieces of brick and cement
	4-6	20	Wet, brown, fine to coarse sand, some small pieces of brick and cement
FCA-2A	0-2	200	Moist, gray-brown silt and fine sand with gray, pink, blue, red, and purple material
	2-4	220	Wet, black, red, pink, and white gummy sludge material
FCA-3	0-2	30	Dark brown to black silt and fine to coarse sand and gravel with fill debris (brick and cement)
	2-4	150	Dark brown to black silt and fine to coarse sand (2-3); Wet, black, fine to coarse sand, gravel, bricks, wood, and cement
FCA-4	0-2	20	Dark brown to black, fine to coarse sand, gravel, and cinders
	2-4	80	Dark brown and gray silt and fine to coarse sand (2-3); Wet gray silt and fine to coarse sand (3-4)
	4-6	5.0	Wet, dark brown to black, fine to coarse sand and gravel
FCA-5	0-1.5	260	Black, gummy sludge material inside FCA building pit
FCA-6	0-2	20	Dark gray to black silt and fine to medium sand
	2-4	5.0	Wet, dark brown silt with fine to coarse sand and gravel
FCA-7	0-2	300	Dark brown to black silt and fine to coarse sand and gravel
	2-4	200	Black, yellow, pink, and purple gummy sludge material
FCA-8	0-2	80	Dark brown silt and fine to coarse sand with gravel
	2-4	120	Moist, black, fine to coarse sand
	4-6	4.0	Wet, black, fine to coarse sand and gravel

Attachment 1 (cont.)  
Summary of Sample Descriptions and Field Observations  
Soil Samples  
Bayonne Barrel and Drum Site  
Newark, New Jersey

Sample #	Sample Depth (feet bgs)	PID (ppm)	Sample Description
<b>Storage Tank Area</b>			
STA-1	0-2	25	Dark brown and black, fine to coarse sand and gravel
	2-4	60	Wet, brown and black, fine to coarse sand with some clay; strong petro odor
STA-2	0-2	120	Brown and black stained fine sand
	2-4	10.0	Dark brown and black, fine to coarse sand with some wet clay
	4-6	15.0	Black, stained, brown clay with some wet, fine to coarse sand
STA-3	0-2	70	Dark brown and black fine to coarse sand
	2-4	100	Dark brown to black fine to coarse sand (2-3); Wet, dark brown to black, clay with some fine to coarse sand; strong petro odor (3-4)

Attachment 1 (cont.)  
 Summary of Sample Descriptions and Field Observations  
 Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Sample #	Sample Depth (feet bgs)	PID- (ppm)	Sample Description
<b>Yard Area Soil Boring Samples</b>			
YA-1	0-2	1.2	Brown silt and fine to coarse sand with fill debris (glass, cement, gravel, yellow-green fine material)
	2-4	3.6	Brown to red, brown, black stained, silt and fine to coarse sand with fill debris
	4-6	4.0	Brown to red, brown, black stained, silt and fine to coarse sand with fill debris
	6-8	2.8	Brown to red, brown, black stained, silt and fine to coarse sand with fill debris
	8-10	3.0	Brown to red, brown, black stained, silt and fine to coarse sand with fill debris
	10-12	3.2	Brown, fine sand with black silt
	12-14	0.6	Brown, fine sand
	14-16	1.2	Brown, fine sand with glass
	16-18	0.8	Wet, brown to black, fine sand with some gray sandy clay
YA-2	0-2	1.6	Brown, orange-brown, fine sand with fill debris (cinders, brick, metal pieces, and gravel), and black staining
	2-4	0.2	Brown, orange-brown, fine sand with fill debris (cinders, brick, metal pieces, and gravel), and black staining
	4-6	0.2	Brown, orange-brown, fine sand with fill debris (cinders, brick, metal pieces, and gravel), and black staining
	6-8	0.4	Brown, fine sand
	8-10	0.6	Molst, brown, fine sand
	10-12	1.0	Wet, brown, fine sand with black staining
YA-3	0-2	10.2	Black stained, brown, fine to coarse sand with fill debris (bricks, gravel, concrete, glass, cinders, and ash)
	2-4	6.8	Black stained, brown, fine to coarse sand and silt with odor
	4-6	2.8	Black stained, brown clay with odor
	6-8	1.8	Wet, black stained, brown clay with odor
YA-4	0-2	0.1	Brown and tan, fine sand with fill debris (glass, metal pieces, brick, and cement) with some black staining
	2-4	0.8	Brown and tan, fine sand with fill debris (glass, metal pieces, brick, and cement) with more black staining
	4-6	18.0	Brown, fine to coarse sand, sand and silt, black staining; strong petro odor
	6-8	16.0	Black stained, brown clay with some fine to coarse sand; strong petro odor
	8-10	10.0	Wet, black stained, brown clay
YA-5	0-2	3.6	Brown, fine to coarse sand with fill debris (cinders, ash, brick, glass, cement, and metal pieces)
	2-4	3.6	Brown, fine to coarse sand with fill debris (cinders, ash, brick, glass, cement, and metal pieces); some black staining
	4-6	2.4	Brown, fine to coarse sand with fill debris (cinders, ash, brick, glass, cement, and metal pieces); more black staining
	6-8	1.8	Black silt with fine to coarse sand and ash; black staining and strong odor
	8-10	0.8	Wet, black silt with fine to coarse sand

Attachment 1 (cont.)  
 Summary of Sample Descriptions and Field Observations  
 Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Sample #	Sample Depth (feet bgs)	PID (ppm)	Sample Description
<b>Yard Area Surface Soil Samples</b>			
YA-6	0-2	0.2	Brown, fine to coarse sand and silt with fill debris (glass, cinders, ash, wood, and bricks)
YA-7	0-2	130	Brown, fine to medium sand with silt and glass; strong odor
YA-8	0-2	2.4	Light brown, fine to medium sand with organic matter (roots and leaves) and fill debris (brick and cinders)
YA-9	0-2	0.1	Brown, fine sand with silt and debris (brick and cinders); slight odor
YA-10	0-2	4.0	Brown, fine sand and silt; black sludge material (petro odor) with fill debris (bricks, glass, metal, and cement)
YA-11	0-2	0.0	Black and brown, fine to medium sand with silt and glass
YA-12	0-2	0.2	Brown, fine sand and silt
YA-13	0-2	2.0	Brown, fine to coarse sand and silt with fill debris (glass, metal, and bricks)
YA-14	0-2	1.6	Fine to medium sand with silt, some organic matter (wood and leaves), and brick
YA-15	0-2	0.2	Brown, fine to medium sand and silt with much fill debris (glass, brick, cement, metal, and some black sludge material (no odor))
YA-16	0-2	2.0	Brown, coarse sand with glass
YA-17	0-2	0.1	Black, coarse sand and fine gravel with ash
YA-18	0-2	0.1	Brown and black, fine to coarse sand with debris (glass, rubber, and a piece of plastic, black clay)
YA-19	0-2	0.0	Black and brown, fine to coarse sand with glass
YA-20	0-2	0.0	Brown to black, medium to coarse sand with cinders
YA-21	0-2	0.8	Brown, fine to coarse sand and gravel; white, coarse, wet, ash material with debris (glass, cement, and bricks)
YA-22	0-2	0.4	Brown, medium to coarse sand with some gravel and glass
YA-23	0-2	1.2	Brown, fine to medium sand with silt and debris (glass, bricks, and concrete)
YA-24	0-2	0.6	Brown to black, medium to coarse sand with cinders; slight odor
YA-25	0-2	1.0	Brown to black, fine to coarse sand with cinder, ash, and some silt
YA-26	0-2	0.0	Brown and black, coarse sand with some gravel
YA-27	0-2	28	Dark brown to black, fine to coarse sand with cinders, ash, and some gravel
YA-28	0-2	0.4	Brown, fine to medium sand with silt and fill debris (brick and glass)
YA-29	0-2	20	Brown, fine to coarse sand with silt and fill debris (bricks and concrete)
YA-30	0-2	4.0	Red-brown clay and black silt with white ash and brick debris
YA-31	0-2	0.6	Brown, medium to coarse sand with fill debris (glass, brick, concrete, and cinders)
YA-32	0-2	0.0	Brown, fine to coarse sand with silt and fill debris (brick and cinders)
YA-33	0-2	0.5	Black and brown, fine sand and brown clay
YA-34	0-2	0.0	Brown to black, fine to coarse sand with debris (glass, brick, and cinders)
YA-35	0-2	1.0	Dark brown, fine to coarse sand with some silt and debris (brick, asphalt, glass, cinders, and ash)
YA-36	0-2	0.6	Dark brown, fine to coarse sand with some silt and debris (cinders, asphalt, and brick)

Attachment 1 (cont.)  
 Summary of Sample Descriptions and Field Observations  
 Soil Samples  
 Bayonne Barrel and Drum Site  
 Newark, New Jersey

Sample #	Sample Depth (feet bgs)	PID (ppm)	Sample Description
<b>Yard Area Surface Soil Samples (continued)</b>			
YA-37	0-2	2.8	Brown, medium to coarse sand with fill debris (brick and glass)
YA-38	0-2	8.6	Brown to black, medium to coarse sand and silt with cinders
YA-39	0-2	14.8	Brown, fine sand with silt and brick
YA-40	0-2	22	Brown, fine sand and silt with packed cinders, ash, and glass
YA-41	0-2	54	Black and brown, medium to coarse sand with glass and nails
YA-42	0-2	7.0	Black and brown; medium to coarse sand and silt with glass
YA-43	0-2	65	Black to brown, fine to coarse sand with fill debris (wood and rubber pieces)
YA-44	0-2	0.0	Brown, fine to medium sand with silt and fill debris (glass, brick, ash, and cinders)
YA-45	0-2	0.1	Brown, fine to medium sand with silt and fill debris (cinders, ash, glass, and plastic)
YA-46	0-2	1.6	Black and gray hard packed gravel (0-1); tan fine sand (1-2)
YA-47	0-2	0.1	Red-brown silt and fine sand (0-1); tan and light brown fine sand (1-2)
YA-48	0-2	15.4	Brown to black, medium to coarse sand with debris (cinders, brick, tile, glass, wood, and plastic)
YA-49	0-2	3.0	Brown, fine to coarse sand with silt and much fill-debris (brick, cinders, and concrete)
YA-50	0-2	84	Brown to black, medium to coarse sand with silt and fill debris (glass, cinders, and brick); slight to moderate odor
YA-51	0-2	12.4	Brown to black, medium to coarse sand with silt and gravel; slight to moderate odor
YA-52	0-2	0.0	Brown, fine sand with silt
YA-53	0-2	210	Black, coarse to fine sand with debris (glass and plastic)
YA-54	0-2	300	Black silt and fine sand with cinders, gravel, plastic, wood, and paper; noticeable odor
YA-55	0-2	22	Black, sand and silt with cinders, gravel, brick, glass, and wood; slight odor
YA-56	0-2	0.2	Brown silt (0-0.3); tan, fine sand (0.3-2.0)
YA-57	0-2	0.1	Brown silt (0-0.5); Red-brown silt (0.5-1.5); Gray, fine sand (1.5-2)
YA-58	0-2	26	Brown, fine to medium sand with silt and gravel

V  
*de maximis, inc.*

186 Center Street  
Suite 290  
Clinton, NJ 08809  
(908) 735-9315

March 11, 1997

**VIA FAX AND U.S. MAIL**

Mr. Joseph Cosentino, On-Scene Coordinator  
Removal Action Branch  
United States Environmental Protection Agency  
2890 Woodbridge Avenue  
Building 209, MS-211  
Edison, New Jersey 08837

**RE: Bayonne Barrel and Drum Site**

Dear Mr. Cosentino:

In the matter of the referenced site, Administrative Order on Consent, Index No: II CERCLA-96-0109, this will confirm that EPA is granting an extension to the due date of the Final Report until March 27, 1997.

During the interim, the laboratory data reports for the samples analyzed with full data QA/QC deliverables will be provided to EPA to facilitate your data validation review.

Very truly yours,

*William J. Lee*  
**de maximis, inc.**



William J. Lee

cc: Bayonne Barrel and Drum Respondents  
Mike McNally, BB&L

▼  
*de maximis, inc.*

186 Center Street  
Suite 290  
Clinton, NJ 08809  
(908) 735-9315  
Fax (908) 735-2132

March 26, 1997

Joseph Cosentino  
USEPA  
Building 209, MS 211  
2890 Woodbridge Ave.  
Edison, NJ 08837

Re: Bayonne Barrel and Drum Site - Soil Investigation Report

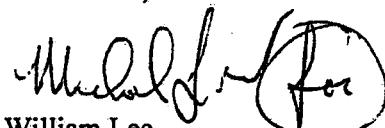
Dear Mr. Cosentino:

Enclosed please find three copies of the Bayonne Barrel and Drum Site Soil Investigation Report for your review. This document presents a summary of the recent soil investigation activities conducted at the site and the analytical results for the samples collected during the investigation. This document has been prepared in accordance with section 300.165 of the National Oil and Hazardous Substances Contingency Plan and fulfills the requirements of the Administrative Order on Consent for the Bayonne Barrel and Drum site dated October 1, 1996. Copies of the analytical data discussed in the report were submitted under a separate cover on March 14, 1997 for your review.

If you should have any questions regarding the Soil Investigation Report, please do not hesitate to contact me at (908) 735-9315.

Very truly yours,

de maximis, inc



A handwritten signature in black ink, appearing to read "Michael J. McNally". To the right of the signature is a small circle containing the letters "for".

William Lee  
Environmental Project Manager

cc: Bayonne Barrel Participating Parties Group  
Michael J. McNally, P.E., Blasland, Bouck & Lee, Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION II

DATE: MAY 11 1998

SUBJECT: Data Validation Completion for Bayonne Barrel and Drum Site, Newark, New Jersey

FROM: Karen Taylor, Chemist *KT*  
Hazardous Waste Support Section (2DESA-HWSB)

TO: Joseph Cosentino, Project Manager  
Enforcement Management Team (2ERRD-RAB)

Please be advised that the Hazardous Waste Support Section has completed review of the data for the Bayonne Barrel and Drum site. The data consisted of four soil samples for inorganic analysis, five soils samples for organic analysis, and 18 soil samples (selected from a total of 99 samples) for dioxin analysis. A summary of the analytical results follows. All data are valid and acceptable except those analytes rejected ("R"). Results which are rejected are not considered useable as a basis for decision making. Results qualified as estimated ("J") are still useable.

Inorganic Data

Aluminum was qualified as estimated ("J") due to matrix spike and matrix spike duplicate quality control (QC) limit exceedance. Since the results are flagged as estimated, they are considered useable.

Beryllium, silver, and zinc were qualified as estimated ("J") because ICP serial dilution percent differences fell outside the acceptable criteria. Results flagged as estimated are considered useable.

Organic Data

Percent differences between the initial and continuing calibration responses exceeded QC limits for and the following analytes which were qualified as estimated ("J"): bromomethane, acetone, 1,2 dichloroethane, 2-butanone, 2-hexanone, 4-methyl-2-pentanone, carbon disulfide, bis(2-chloroethyl)ether, 1,2-dichlorobenzene, 4-methylphenol, n-nitroso-di-n-propylamine, naphthalene, 2-methylnaphthalene, acenaphthylene, 3-nitroaniline, dibenzofuran, fluorene, 4-chlorophenyl-phenylether, 4-nitroaniline, carbazole, phenanthrene, butylbenzylphthalate, 3,3'-dichlorobenzidine, hexachloroethane, 4-nitrophenol, indeno(1,2,3-cd)pyrene, bis(2-chloroethoxy)methane, hexachlorocyclopentadiene, 4-bromophenyl-phenylether, hexachlorobenzene, 2,4-dinitrophenol, benzo(k)fluoranthene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. This is a measure of the instrument's daily performance and exceedance of this specification may affect quantitation.

The following analytes have internal standards that exceeded criteria and were qualified as estimated ("J"): di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene. Internal standards detect instability in instrument sensitivity and response.

### Dioxin Data

Internal standard percent recoveries were below the analytical method criteria. The following associated non-detect results were "R" qualified and positive results were "J" qualified: 2,3,7,8-TCDF, 3,4,7,8-PeCDF, 3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8,9-OCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8,9-OCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, and 1,2,3,4,7,8,9-HpCDF. Totals for TCDD, TCDF, PeCDD, PeCDF HpCDD, HxCDF, HpCDF, and HxCDD were qualified as estimated ("J"). Internal standards measure instability in instrument sensitivity and response.

Recovery standard area counts exceeded upper limits, resulting in the qualification of the following analytes as estimated ("J"): 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,6,7,8,9-OCDD, 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF and 1,2,3,4,6,7,8,9-OCDF. Totals for TCDF, PeCDD, PeCDF, HxCDF, HpCDF, and HpCDF were qualified as estimated ("J"). Recovery standards are also used to assess instrument sensitivity.

Total TCDF, PCDF and PeCDF were qualified as estimated ("J") since there is an associated diphenyl ether interference. The interference may influence this value to be overestimated.

Peak resolution was poor for 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8-HxCDD, and 1,2,3,7,8,9-HxCDF. 1,2,3,4,7,8-HxCDD and 1,2,3,7,8,9-HxCDF were qualified as "R" since they were reported as non detects and poorly resolved. The presence or absence of these analytes cannot be reasonably determined. 2,3,7,8-TCDF and 2,3,4,6,7,8-HxCDF, 1,2,3,7,8-PeCDF were qualified "J" since their reported values could be overestimated.

If you have any questions or require further information, please contact me at (732) 321-4436.

cc: Robert Runyon, 2DESA-HWSB  
Richard Salkie, 2DESA-RAB  
John Witkowski, 2ERRD-RAB